

No. 2 — *Further Revisions of African Snake Genera*

BY ARTHUR LOVERIDGE

The miscellaneous genera here assembled are not quite so diverse as may appear at first sight, the majority of them being sylvicoline and largely associated with rain forest. In fact the uniformly black species or races of the four subfossorial genera are sufficiently similar as to be difficult to differentiate in the field, while some have actually been mistaken for burrowing vipers (*Atractaspis*) by several herpetologists of note. The new monotypic genus is erected for a species which occupies a somewhat intermediate position between *Naja* and *Elapsoidea*, having been referred to the former by Werner and Nieden, to the latter by Boulenger and de Witte.

These revisions, with the exception of the last two, were undertaken four years ago during preparation of a report (1942, Bull. Mus. Comp. Zool., **91**, pp. 237-373) on the 81 species, or races, of snakes collected during the course of an expedition sponsored by the John Simon Guggenheim Memorial Foundation, to which this Museum is grateful for much of the comparative material which has made these studies possible. There remained, however, certain species or races unrepresented in any American museum, besides questions regarding types which could be satisfactorily settled only by reference to European museums. With this object in view the revisions were put on one side, but as another three years may elapse before conditions are sufficiently settled to deal with such matters, I have thought it better to delay their publication no longer, though the synoptical keys to some were included in the aforementioned report.

Since the Uganda Journal is inaccessible to many herpetologists, I have deviated from usual practice and furnished both page reference to Pitman's articles in the Journal (1935-1938a) as well as the repagination as they appeared in book form (1938b) of his "Guide to the Snakes of Uganda," such being followed in parenthesis by the word 'reprint.' In such cases it is listed under the name or spelling as finally adopted in the concluding parts.

In all other respects the procedure adopted is similar to that outlined in the earlier of half-a-dozen similar revisions published in this Bulletin during recent years (1939-1944). In each I have attempted to assemble all pertinent data and information published since 1880 after allocating it to its subspecies as here recognized. Where an author furnishes a locality record without scale-counts or other data

which would assist in checking his identification, the locality in question is listed under the subspecies within whose range it occurs, usually with footnote or other comment. The generic definitions are substantially those of Boulenger (1894a, 1896d) modified or expanded to include the findings of C. M. Bogert and others.

The opportunity is taken of thanking both Messrs C. M. Bogert (American Museum) and V. FitzSimons (Transvaal Museum) for all the trouble they have taken to supply me with data of specimens in their care, the latter furnishing scale counts of thirty-one *Elapsoidea*, while the former and Messrs K. P. Schmidt and C. H. Pope (Chicago Natural History Museum) leave me indebted for the loan of material.

Index to the Species Recognized

AGLYPHA	PAGE
* <i>Rhamnophis batesii</i> (Boulenger)	125
* <i>Rhamnophis aethiopissa aethiopissa</i> Günther	126
* <i>Rhamnophis aethiopissa ituriensis</i> Schmidt	128
* <i>Rhamnophis aethiopissa elgonensis</i> Loveridge	129
<i>Thrasops occidentalis</i> Parker	131
* <i>Thrasops flavigularis</i> (Hallowell)	132
* <i>Thrasops jacksonii jacksonii</i> Günther	134
* <i>Thrasops jacksonii schmidti</i> Loveridge	137
* <i>Duberria lutrix abyssinica</i> (Boulenger)	139
* <i>Duberria lutrix shirana</i> (Boulenger)	142
* <i>Duberria lutrix lutrix</i> (Linnaeus)	144
<i>Duberria variegata</i> (Peters)	147
 OPISTHOGLYPHA	
* <i>Thelotornis kirtlandii kirtlandii</i> (Hallowell)	149
* <i>Thelotornis kirtlandii capensis</i> Smith	154
* <i>Calamelaps concolor</i> (Smith)	161
<i>Calamelaps unicolor polylepis</i> Bocage	162
* <i>Calamelaps unicolor warreni</i> Boulenger	163
* <i>Calamelaps unicolor unicolor</i> (Reinhardt)	165
<i>Calamelaps unicolor feae</i> Boulenger	168
* <i>Miodon acanthias</i> (Reinhardt)	170
<i>Miodon gabonensis gabonensis</i> (Duméril)	172
* <i>Miodon gabonensis notatus</i> (Peters)	173
* <i>Miodon gabonensis collaris</i> (Peters)	175
* <i>Miodon gabonensis christyi</i> Boulenger	178
* <i>Miodon gabonensis graueri</i> Sternfeld	180

AGLYPHA + OPISTHOGLYPHA

* <i>Aparallactus lineatus</i> (Peters)	183
* <i>Aparallactus modestus</i> (Günther)	186
<i>Aparallactus liddiardae</i> Parker	191
* <i>Aparallactus concolor</i> (Fischer)	192
* <i>Aparallactus lunulatus</i> (Peters)	195
* <i>Aparallactus jacksonii</i> (Günther)	197
* <i>Aparallactus werneri</i> Boulenger	199
* <i>Aparallactus turneri</i> Loveridge	201
<i>Aparallactus capensis bocagii</i> Boulenger	202
* <i>Aparallactus capensis capensis</i> Smith	205
* <i>Aparallactus capensis uluguruensis</i> Barbour & Loveridge	210
<i>Aparallactus nigriceps</i> (Peters)	212

PROTEROGLYPHA

<i>Elapsoidea sundervallii laticincta</i> (Werner)	216
* <i>Elapsoidea sundervallii decosteri</i> Boulenger	217
* <i>Elapsoidea sundervallii semiannulata</i> Bocage	220
* <i>Elapsoidea sundervallii güntherii</i> Bocage	222
* <i>Elapsoidea sundervallii nigra</i> Günther	225
* <i>Elapsoidea sundervallii sundervallii</i> (Smith)	228
* <i>Elapsoidea sundervallii fitzsimonsi</i> subsp. nov.	229
* <i>Paranaja</i> gen. nov.	231
<i>Paranaja multicincta multicincta</i> (Werner)	233
* <i>Paranaja multicincta anomala</i> (Sternfeld)	234

* Represented in the collections of the Museum of Comparative Zoölogy; examples of species or forms without asterisk are earnestly desired.

Genus RHAMNOPHIS

1862b. *Rhamnophis* Günther, Ann. Mag. Nat. Hist. (3), 9, p. 129, pl. x (type *aethiopissa* Günther).

1864b. *Crypsidomus* Günther, Proc. Zool. Soc. London, p. 309 (substitute name).

Maxillary teeth 17–35, followed after an interspace by 3 enlarged ones; anterior mandibular teeth slightly enlarged. Head rather short, distinct from neck; eye very large, with round pupil; nasal divided or semi-divided; a loreal; a preocular¹. Body compressed; scales oblique, narrow, smooth, with apical pits, in 13–19 rows of which the vertebral is distinctly enlarged; ventrals rounded or obtusely keeled laterally. Tail long; subcaudals in two rows.

Range. Africa in forested areas of equatorial belt from French Guinea to western Kenya Colony.

Remarks. The substitute name *Crypsidomus* was proposed by Günther in the mistaken belief that his *Rhamnophis*, 1862, was pre-occupied by *Rhamphiophis* Peters, 1854. It is by no means sure that *Rhamnophis* should not be united with *Thrasops* Hallowell, 1857, with which it has been confused, and from which it is barely separable.

The above description is largely that of Boulenger (1896d, p. 632) after exclusion of the keeled-scaled *Thrasops jacksonii*, and extension of the maxillary tooth count resulting from the inclusion of *batesii*, together with notes on its dentition kindly supplied me by Bogert in 1940.

Key to the Species

1. Midbody scale-rows 13; anal entire; subcaudals less than 116; maxillary teeth 30+3 to 35+3.....*batesii*
(p. 125)
Midbody scale-rows 15–19; anal divided; subcaudals more than 116; maxillary teeth 17+3 to 20+3.....2
2. Midbody scale-rows 17, very rarely 15, 16, or 19; lower postocular in contact with 3 upper labials; range: French Guinea east to the western Belgian Congo.....*a. aethiopissa*
(p. 126)
Midbody scale-rows 15, very rarely 17; lower postocular in contact with 2 or 3 upper labials; range; eastern Belgian Congo to western Kenya Colony.....3
3. Subcaudals 134–150; normally upper labials 8, sometimes 7; range: Ituri region of eastern Belgian Congo.....*a. ituriensis*
(p. 128)

¹ Rarely 2, *vide* Werner.

Subcaudals 117-138; normally upper labials 7, sometimes 6 or 8; range: western Uganda to western Kenya Colony *a. elgonensis* (p. 129)

RHAMNOPHIS BATESII (Boulenger)

- 1908a. *Thrasops batesii* Boulenger, Ann. Mag. Nat. Hist. (8), **2**, p. 93: Akok and Efulen, French Cameroon.
 1909b. Sternfeld, p. 16.
 1919b. Boulenger, p. 283.
 1929a. Werner, p. 97.
 1923. *Rhamnophis batesii* Schmidt, p. 83, fig. 5.

Description. Rostral twice as broad as deep, just visible from above; nasal divided or semidivided; internasals as broad as long, about as long as the prefrontals; frontal bell-shaped, once and a half to twice as long as broad (in the middle), longer than its distance from the end of the snout, as long as, or a little longer or shorter than, the parietals, as broad as a supraocular; loreal longer than deep; preocular 1, in contact with or separated from the frontal; eye very large, its diameter much greater than its distance from the mouth, postoculars 3, the lowest in contact with 3 upper labials; temporals 1, or 1+1 and occipital; occipitals 4; upper labials 7 or 8, the fourth and fifth or fifth and sixth entering the orbit; 4-6 lower labials in contact with the anterior sublinguals, which are about as long as the median pair. Midbody scales in 13 rows, smooth, oblique, the vertebral row enlarged; ventrals 163-177; anal entire; subcaudals 91-114 pairs.

Dentition. Boulenger found about 30+3 maxillary teeth, Bogert — for Ituri specimens — 35+3, the enlarged posterior ones separated by a diastema from the subequal anterior teeth.

Color. Above, pale brown or pea green, each scale edged or striped with black and spotted with lighter which may form irregular or interrupted crossbands; labials edged with black posteriorly. Below, white anteriorly with scattered black spots, brown or olive posteriorly blotched with darker.

For further notes on color, see Schmidt (1923, p. 84).

Size. Total length of ♂ (M.C.Z. 38393), 1217 (827 + 390) mm. from Batouri district, Cameroon, surpassed by that of an unsexed cotype (Brit. Mus.) of 1800 (1450 + 350 mm.)

Localities. **French Cameroon:** Akok; Batouri district; Efulen; Ja River district. **Belgian Congo:** Gamangui; Niapu.

Range. French Cameroon east to the Ituri region, Belgian Congo.

RHAMNOPHIS AETHIOPISSA AETHIOPISSA Günther

- 1862b. *Rhamnophis aethiopissa* Günther, Ann. Mag. Nat. Hist. (3), 9 p.
129, pl. x: West Africa.
- 1884a. Rochebrune, p. 176, pl. xix, fig. 1 (ignored).
- 1875a. *Rhamnophis aethiops* Peters, p. 199.
- 1876a. Peters, p. 119.
- 1896d. Boulenger, p. 632.
- 1897b. Mocquard, p. 13.
1897. Sjöstedt, p. 35.
- 1897b. Werner, p. 399.
- 1898a. Werner, p. 210.
- 1899a. Werner, p. 138.
- 1900b. Boulenger, p. 453.
- 1902a. Werner, p. 344.
- 1906i. Boulenger, p. 213.
1906. Johnston, p. 832.
1909. Gendre, p. cvi (as *Rhaumophis*).
- 1915a. Boulenger, p. 207.
1917. Chabanaud, p. 372.
- 1917b. Chabanaud, p. 11.
- 1919b. Boulenger, p. 284.
- 1919g. Boulenger, p. 23.
1922. Aylmer, p. 15.
- 1927d. Witte, p. 324.
- 1933f. Angel, p. 118, figs. 43-43a (not 44-44a; captions transposed).
- 1933m. Witte, p. 90.
- 1888a. *Crypsidomus aethiops* Boettger, p. 64.
1890. *Crypsidomus aethiopissa* Büttikofer, p. 478.
- 1891b. *Chrysidomus aethiops* Matschie, p. 616.
1892. Zenker, p. 183.
- 1893c. Matschie, p. 212.
1901. *Thrasops splendens* Andersons, Bihang Till K. Svenska Vet.-Akad.
Handl., 27, No. 5, p. 11, pl. i, fig. 8: Bibundi and Mapanja, British
Cameroon.
- 1908a. *Thrasops aethiops* Sternfeld, pp. 409, 425.
- 1908b. Sternfeld, pp. 215, 230.
- 1909a. Sternfeld, p. 15.
- 1909b. Sternfeld, p. 17.
1910. Müller, p. 602.
1911. Lampe, p. 194.
- 1929a. Werner, p. 97.
- 1941e. *Rhamnophis aethiopissa aethiopissa* Loveridge, p. 121.

Further citations of '*aethiops*' will be found under *a. ituriensis*.

Description. Rostral twice as broad as deep, visible from above; nasal divided or semidivided; internasals as broad as long, about as long as the prefrontals; frontal bell-shaped, twice as long as broad (in the middle), as long as, or slightly longer than, its distance from the end of the snout, as long as, or a little shorter than, the parietals, as broad as a supraocular; loreal longer than deep; preocular 1, rarely 2,¹ in contact with or separated from the frontal; eye very large, its diameter much greater than its distance from the mouth; postoculars 2, rarely 3 or 4,¹ the lower in contact with 3 upper labials; temporals 1, or 1 + 1 and occipital (or 1 + 2, *fide* Boulenger); occipitals 2, usually present; upper labials 8, the fourth and fifth, rarely fourth, fifth and sixth, entering the orbit; 4 or 5 lower labials in contact with the anterior sublinguals, which are shorter than the median pair. Midbody scales in 17, rarely 15 (French Congo, *fide* Angel) 16 (Liberia, *fide* Loveridge) or 19 (French Cameroon, *fide* Müller) rows, smooth, oblique, the vertebral row enlarged; ventrals 158–179; anal divided; subcaudals 139–159 pairs.

Dentition. 19 or 20 + 3 maxillary teeth, the enlarged posterior ones separated by a diastema from the subequal anterior teeth.

Color. Above, green, each scale heavily edged with black; head pale olive, the shields usually spotted and edged with black; five broad black lines on tail. Below, pale olive or yellow with a light line along either lateral angle; outer ends of ventrals green edged with black; tail with a narrow, median, black line and edged with black laterally.

Size. Total length of ♂ (cotype of *splendens* in Stockholm Museum). 1330 (855 + 475) mm. from British Cameroon; of ♀ (cotype Stock, Mus. 1979) 1470 (950 + 520) mm. from Bibundi, British Cameroon; both surpassed by Boulenger's unsexed record of 1500 (970 + 530) mm.

Remarks. Angel (1933f, p. 118) has synonymized *ituriensis* with *aethiopissa* on account of the occurrence in the French Congo of a specimen with 15 midbody scale-rows. The incidence is so slight, however (*circa* 3%) as not to invalidate the recognition of *ituriensis* as a race within whose range 10% may have 17 midbody scale-rows. In passing, it might be pointed out that the captions under the figures of *T. jacksonii* and *R. aethiops* have been transposed.

Localities. **Senegal** ? (*fide* Rochebrune). **French Guinea:** Ditinn (Ditiun). **Sierra Leone.** **Liberia:** Harbel. **Gold Coast:** Accra. **Togo:** Adele (Bismarckburg); Kete; Misahohe. **Nigeria:** Lagos. **British Cameroon:** Bibundi; Buea; Isongo; Mapanja;

¹*fide* Werner.

Victoria. **French Cameroon:** Batouri district; Bipindi; Dehane; Dibongo near Edea; Longji; Yaundeland. **Fernando Po. French Congo:** Lambarene; Ogowe. **Belgian Congo:** Banziville; Makaia Ntete; Umangi.

Range. French Guinea east to the western Belgian Congo.

RHAMNOPHIS AETHIOPISSA ITURIENSIS Schmidt

- 1919g. *Rhamnophis aethiops* Boulenger (part), p. 23.
 1934a. Schwetz, pp. 381, 383.
 1923. *Rhamnophis ituriensis* Schmidt, Bull. Am. Mus. Nat. Hist., **49**, p. 81, fig. 4: Niapu, Belgian Congo.
 1933m. Witte, p. 90.
 1936. Pitman (part), p. 49 (but not plates).
 1938b. Pitman (part), p. 104 (but not plates, reprint).
 1929a. *Thrasops ituriensis* Werner, p. 97.

Further citations of '*ituriensis*' will be found under *a. elgonensis*.

Description. Rostral about twice as broad as deep, just visible from above; nasal divided; internasals as broad as long, about as long as the prefrontals; frontal bell-shaped, once and three-quarters as long as broad (in the middle), as long as its distance from the end of the snout, slightly shorter than the parietals, as broad as a supraocular; loreal longer than deep; preocular 1, in contact with or separated from the frontal; eye very large, its diameter much greater than its distance from the mouth; postoculars 2, rarely 3 or 4, the lower in contact with 2 upper labials; temporals 1, or 1 + 1 and occipital; occipitals 2, rarely 3; upper labials 7, rarely 6 or 8, the fourth and fifth entering the orbit; 4 or 5 lower labials in contact with the anterior sublinguals, which are shorter than the median pair. Midbody scales in 15, rarely 17, rows, smooth, oblique, the vertebral row enlarged; ventrals 159–172; anal divided; subcaudals 134–150 pairs.

Color. Above, green (bluish black in alcohol), each scale edged or striped with black and spotted or striped with lighter; five broad black lines on tail. Below, chin and throat yellowish, rest olive with a light line along either lateral angle, a black spot either adjacent to this line or at the outer end of the ventrals; tail with a narrow, median, black line and edged with black laterally.

Size. Total length of type ♂ (A.M.N.H. 12505), 1305 (865 + 440) mm. of paratype ♀ (A.M.N.H.), 1290 (832 + 458) mm. both from Niapu.

Parasites. Hemogregarines reported from a Stanleyville snake by Schwetz.

Localities. **Belgian Congo:** Gamangui; Medje; Niangara; Niapu; Stanleyville. (Reported from Uganda in error by Pitman).

Range. Eastern Belgian Congo.

RHAMNOPHIS AETHIOPISSA ELGONENSIS Loveridge

- 1916a. *Thrasops rothschildi* Loveridge (not Mocquard), pp. 79, 84.
- 1923e. Loveridge (part), p. 879 (Yala specimens only).
- 1929h. *Rhamnophis aethiopissa elgonensis* Loveridge, Bull. U. S. Nat. Mus. **151**, p. 24: Yala (= Lukosa) River, Kenya Colony.
- 1937f. Loveridge, p. 502.
- 1938a. Pitman, p. 210.
- 1938b. Pitman, p. 308 (reprint).
- 1942e. Loveridge, p. 276.
- 1936. *Rhamnophis ituriensis* Pitman (part), p. 49, pl. vi. fig. 6, pl. T, fig. 3.
- 1938a. Pitman, pp. 210, 231.
- 1938b. Pitman, pp. 104-106, 308, 329, pls. as above (reprint).

Description. Rostral once and two-thirds to twice as broad as deep, visible from above; nasal divided (its posterior half fused with loreal only in the type specimen); internasals broader than long (in young) or as broad as long (in adults), about as long as the prefrontals; frontal bell-shaped, once and a half as long as broad (in the middle), as long as (adult) or much longer than (young) its distance from the end of the snout, noticeably shorter than the parietals, much broader than a supraocular; loreal longer than deep; preocular 1, in contact with or separated from the frontal; eye very large, its diameter much greater than its distance from the mouth; postoculars 2, the lower in contact with 2 upper labials; temporals 1, or 1 + 1, or 1 + 1 and occipital; occipitals 2; upper labials 7, rarely 5, 6 or 8, the fourth and fifth or third and fourth entering the orbit; 4 or 5 lower labials in contact with the anterior sublinguals, which are shorter than the median pair. Midbody scales in 15 rows, smooth, oblique, the vertebral row enlarged; ventrals 154-164; anal divided; subcaudals 117-138 pairs.

Color. Above, green, each scale edged with black; head olive, uniform or the shields edged with black, upper labials pale green anteriorly and yellowish posteriorly in their upper portion, blue below; five broad black lines on tail. Below, ventrals greenish flecked with white, a brown line along either lateral angle, outer ends of ventrals

pale olive green, tail with a median dusky line flanked by irregular dark flecks.

The above was based on notes made in the field of a snake from Kibale Forest. For further notes on color, see Pitman (1938b, p. 105, and col. pl. T, fig. 3) under name of "*ituriensis*".

Size. Total length of ♂ 1255 (825 + 430) mm. from Budongo Forest (Pitman); of type ♀ (M.C.Z. 18198), 1147 (760 + 387 mm.) from Yala River.

Localities. **Uganda:** Budongo Forest; Kajansi Forest; Kibale Forest; Mabira Forest. **Kenya Colony:** Kaimosi; Kakamega; Yala River.

The last three localities are really one, Kaimosi being only an hour's walk from the Yala River flowing through the Kakamega Forest, which is an outlier of the Elgon Forest. The species has not as yet been taken on Mount Elgon.

Range. Western Uganda to western Kenya Colony.

Genus THRASOPS

1857. *Thrasops* Hallowell, Proc. Acad. Nat. Sci. Philadelphia, p. 67 (type *Dendrophis flavigularis* Hallowell).

Maxillary teeth 17-18, followed after an interspace by 3-4 enlarged ones; anterior mandibular teeth slightly enlarged. Head rather short, distinct from neck; eye large, with round pupil; nasal divided, semi-divided, or entire; a loreal; 1 or 2 preoculars. Body more or less compressed; scales oblique, strongly imbricate, smooth in young, at least the median ones keeled in adults, with apical pits, in 13-21 rows; ventrals rounded or with a discontinuous lateral keel. Tail long; subcaudals in two rows.

Range. Africa in forested areas of equatorial belt from French Guinea east to central Kenya Colony.

Remarks. It is possible that the so-closely related genus *Rhamnophis* Günther, 1862, may ultimately have to be united with *Thrasops*. Schmidt (1923, p. 83), however, states that in *R. a. ituriensis* the hemipenis has four large spines about its base, the remainder being calyculate, while in *T. j. jacksonii* the hemipenis is heavily spinose on one side for its entire length. The hemipenes of both *T. j. jacksonii* and *T. flavigularis* have been described in detail by Bogert (1940, pp. 58, 59) who finds them almost identical in structure.

Key to the Species

1. Three labials in contact with the lower postocular; midbody scale-rows 15-19; ventrals 175-187; subcaudals 120-140; range: French Guinea east to Togo.....*occidentalis*
(p. 131)
Two, very rarely 3, labials in contact with the lowest postocular; range: Nigeria east to Kenya.....2
2. Midbody scale-rows 13-15; the dorsals much longer than the ventrals; range: Nigeria south to Cabinda and western Belgian Congo *flavigularis*
(p. 132)
Midbody scale-rows 17-21; the dorsals not or but slightly longer than the ventrals; range: central Belgian Congo east to Kenya Colony.....3
3. Midbody scale-rows 19, rarely 17 or 21; ventrals 187-211; range: central Belgian Congo east to western Tanganyika Territory and western Kenya Colony.....*j. jacksonii*
(p. 134)
Midbody scale-rows 17; ventrals 170-178; range: Mount Kenya to Nairobi in Central Kenya Colony.....*j. schmidtii*
(p. 137)

THRASOPS OCCIDENTALIS Parker

- 1894a. *Thrasops flavigularis* Boulenger (part), p. 105.
 1906. Johnston, p. 832.
 1909. Gendre, p. cvi.
 1915a. Boulenger (part), p. 206.
 1919b. Boulenger (part), p. 283.
 1922. Aylmer, pp. 15, 19.
 1929a. Werner (part), p. 97.
 1933f. Angel (part), p. 115.
 1908b. *Thrasops jacksoni* Sternfeld (not Günther), pp. 215, 230, figs. 2-3.
 1909a. Sternfeld, p. 16, figs. 21-22.
 1929a. Werner (part), p. 98.
 1915a. *Rhamnophis jacksonii* Boulenger (part), p. 207.
 1915c. Boulenger (part), p. 624.
 1919b. Boulenger (part), p. 284.
 1919g. Boulenger (part), p. 23.
 1922. Aylmer, p. 15.
 1940a. *Thrasops occidentalis* Parker, Ann. Mag. Nat. Hist. (11), 5, p. 273, figs. 1 and 2a: Axim, Gold Coast.

Description. Rostral subquadrangular, a little broader than deep, visible from above; nasal divided; internasals as long as the prefront-

als; frontal slightly longer than broad, longer than its distance from the rostral (in adult), longer than its distance from the end of snout (in young), slightly shorter than the parietals; no enlarged occipitals; loreal present; preocular 1, separated from the frontal; eye large, its diameter much greater than its distance from the mouth; postoculars 3, lowest in contact with 3 upper labials; temporals 1 + 1; upper labials 8, rarely 7, the fourth and fifth entering the orbit; 4 lower labials in contact with the anterior sublinguals, which are shorter than the posterior. Midbody scales in 15–19 rows, not longer than the ventrals, at least the median rows keeled in adults though all may be smooth in young; ventrals 175–187; anal divided; subcaudals 120–140 pairs.

Color. Above, in adults, black; in young, head and neck olive, sides of head whitish, the sutures between the scales picked out in black, dorsum chequered with subrectangular black and yellow spots arranged in 6 to 8 longitudinal rows. Below, in adults, chin and throat straw colored, otherwise dark olive; in young, chin and throat whitish, belly black, the ventrals with alternately two or three transversely oval yellow spots; subcaudals yellow margined with black.

Size. Total length of paratype ♂ (B.M. 66.1.28.6), 1165 (670 + 495) mm. from Sierra Leone; of ♀ holotype (B.M. 1911.6.30.2), 1085 (682 + 403) mm. from Axim, Gold Coast.

Remarks. In the absence of material, I have based the above description on that of Parker, supplemented by such additional data as is to be found in the literature cited above.

Localities. **French Guinea:** Ditinn (Diteien); Labe; Yambering. **Sierra Leone.** **Liberia:** Monrovia. **Gold Coast:** Axim; Dunkwa. **Togo:** Misahöhe.

Range. French Guinea east to Togo (Rochebrune's (1884a, pp. 174, 176) records of *niger* and *flavigularis* from Senegambia are questionable and omitted).

THRASOPS FLAVIGULARIS (Hallowell)

- 1852b. *Dendrophis flavigularis* Hallowell, Proc. Acad. Nat. Sci. Philadelphia, p. 205: "Liberia" later corrected to Gaboon.
- 1857. Hallowell, p. 66.
- 1857. *Thrasops flavigularis* Hallowell, p. 67.
- 1877c. Peters, p. 615.
- 1888a. Boettger, p. 63 (inc. var. *pustulata*).
- 1889. Boettger, p. 279 (inc. var. *pustulata*).
- 1889. Hesse, p. 267.
- 1894a. Boulenger (part), pp. 105, 358.

- 1895a. Bocage, p. 97.
- 1897b. Boulenger, p. 278.
- 1897. Sjöstedt, p. 35.
- 1898. Boettger, p. 59.
- 1898a. Werner, p. 208.
- 1899a. Werner, p. 138.
- 1900b. Boulenger, p. 453.
- 1902a. Werner, p. 344.
- 1905f. Boulenger, p. 185.
- 1906i. Boulenger, p. 213.
- 1908a. Sternfeld, pp. 408, 425.
- 1909b. Sternfeld, p. 16, figs, 18-19.
- 1911. Lampe, p. 194.
- 1915a. Boulenger (part), p. 206.
- 1919b. Boulenger (part), p. 283.
- 1927d. Witte, p. 324.
- 1929a. Werner (part), p. 97.
- 1933f. Angel (part), p. 115.
- 1933m. Witte, p. 90.
- 1938b. Mertens, p. 47.
- 1940. Bogert, p. 58.
- 1940a. Mertens, p. 241.
- 1940a. Parker, p. 271, fig. 2b.
- 1872a. *Hapsidophrys niger* Günther, Ann. Mag. Nat. Hist. (4), 9, p. 25: Gaboon.
- 1875a. *Thrasops pustulatus* Buchholz & Peters, Monatsb. Akad. Wiss. Berlin, p. 199: Mungo, British Cameroon.
- 1876a. Peters, p. 119.

For other citations see *occidentalis* with which it has been long confused.

Native name. *Mduma* (near Banana, *fide* Hesse).

Description. Rostral subquadrangular, about once and a third to once and a half as broad as deep (in the middle), visible from above; nasal divided, semidivided or entire; internasals broader than long (in young) or as broad as long (in adults), about as long as the prefrontals; frontal once and two-thirds to twice as long as broad (in the middle), as long as its distance from the rostral (adult) or longer than its distance from the end of the snout (young), as long as the parietals; as broad as, or narrower than, a supraocular; loreal present; preocular 1, rarely 2, separated from the frontal; eye large, its diameter much greater than its distance from the mouth; postoculars 3, the lowest in contact with 2, very rarely 3, upper labials; temporals 1 + 1; upper

labials 8, rarely 9, the fourth and fifth or rarely fifth and sixth entering the orbit; 3-5 lower labials in contact with the anterior sublinguals, which are shorter than the posterior. Midbody scales in 13 or 15 rows, much longer than the ventrals, at least the median dorsals keeled in adults, all smooth in young; ventrals 196-215; anal divided; subcaudals 128-146 pairs.

Anatomy. Both dentition and hemipenes are discussed under the generic definition.

Color. Above, in adults, uniformly black with a silken lustre; in half-grown or young, dark brown or dark olive, the neck yellow with black-tipped scales and orange on the sides, dorsum chequered with black and yellow spots, the former predominating. Below, in adults, black, though paler than dorsum, uniform, or the throat yellowish, grayish, or brownish white; in half-grown or young, chequered black and yellow on belly, with roundish yellow spots disposed alternately on the inner and outer part of successive scales on belly and tail.

Boettger (1889, p. 279) also furnishes detailed color descriptions.

Size. Total length of unsexed record 2000 (1440 + 560) mm. from Isongo (*vide* Lampe); of ♀ (type of *niger*, Brit. Mus.), 1552 (1120 + 432) mm. from Gaboon.

Diet. Mammal remains in a Metet snake (Bogert); a chameleon (*C. gracilis etiennei*) in a Povo Nemlao reptile. (Boettger).

Habitat. Arboreal in primary forests.

Localities. **Nigeria.** **British Cameroon:** Bibundi; Bota; Buea; Isongo; Mungo; Tiko; Victoria. **French Cameroon:** Bipindi; Dehane; Ebolowa; Kribi; Metet; Pungo Songo; Sakbayeme; Yaunde. **Fernando Po:** Moka. **Spanish Guinea.** **French Congo:** Gaboon; Loango River. **Belgian Congo:** Bikori (? Bikoro); Ganda Sundi; Kwango (Kuango) River; "Mayon"; Povo Nemlao nr. Banana; Temvo nr. Mayumbe; Vista. **Cabinda:** Chinchexo.

Range. Nigeria south to Cabinda and western Belgian Congo (Records of *flavicularis* and *jacksonii* from west of Nigeria are referable to *occidentalis* Parker, 1940).

THRASOPS JACKSONII JACKSONII Günther

1895. *Thrasops Jacksonii* Günther, Ann. Mag. Nat. Hist. (6), **15**, p. 528: Kavirondo, Kenya Colony.
 1910a. Sternfeld, p. 20, figs. 18-19.
 1923. Schmidt, p. 85. fig. 6.

- 1924b. Loveridge, p. 5.
 1928j. Loveridge, p. 75.
 1929a. Werner, p. 98.
 1933f. Angel, p. 116, figs. 44-44a (*not* 43-43a; captions transposed).
 1940a. Parker, p. 271, fig. 3.
 1896d. *Rhamnophis jacksonii* Boulenger, p. 632.
 1902a. Boulenger, p. 446.
 1909. Peracca, p. 172.
 1911c. Boulenger, p. 165.
 1912. Hobley, p. 49.
 1915a. Boulenger (part), p. 207.
 1915c. Boulenger (part), p. 624.
 1916a. Loveridge, p. 84.
 1919b. Boulenger (part), p. 284.
 1919g. Boulenger (part), p. 23.
 1923e. Loveridge (part), p. 879.
 1933m. Witte, p. 90 (but Temvo record should be checked).
 1934a. Schwetz, pp. 381, 383.
 1934b. Schwetz, p. 24.
 1905b. *Thrasops Rothschildi* Mocquard, Bull. Mus. Hist. Nat. Paris, **11**, p. 287: "Afrique orientale anglaise."
 1915c. Boulenger, p. 624.
 1923e. Loveridge (part), p. 879.
 1929a. Werner, p. 97.
 1936j. *Thrasops jacksonii jacksonii* Loveridge, p. 249.
 1936. Pitman, p. 52, pl. vii, fig. 1, pl. G, fig. 4.
 1937c. Loveridge, p. 274.
 1937f. Loveridge, p. 502.
 1938a. Pitman, pp. 210, 231.
 1938b. Pitman, pp. 39, 107, 308, 329, pls. and figs. as above (reprint).
 1940. Bogert, p. 58.
 1942e. Loveridge, p. 277.

Further citations of '*jacksonii*' and '*rothschildi*' will be found under *Rhamnophis a. elgonensis*, *T. occidentalis* and *T. j. schmidtii*.

Native names. *Mambala* (at Stanleyville, *fide* Schwetz); *wahimbiri* (Wamba and Toro); *ntemankima* (Ganda); *isilukanga* (Gishu for olivaceous halfgrown examples); *yakobe* (Gishu for black adults). Probably confused with *Dispholidus typus*.

Description. Rostral subquadrangular, about once and a quarter to once and a half as broad as deep (in the middle), visible from above; nasal divided, semidivided or entire; internasals broader than long (in young) or as broad as long (in adults), about as long as the prefrontals;

frontal once and a third to twice as long as broad (in the middle), as long as, or longer, or shorter than, the parietals; as broad as, or broader than, a supraocular; loreal present; preoculars 1 or 2, separated from, or in contact with, the frontal; eye large, its diameter much greater than its distance from the mouth; postoculars 3, rarely 4, the lowest in contact with 2, very rarely 3, upper labials; temporals 1 + 1; upper labials 8, rarely 9, the fourth and fifth or rarely fifth and sixth entering the orbit; 4 or 5 lower labials in contact with the anterior sublinguals, which are subequal to, or shorter than, the posterior. Midbody scales in 17 or 19, very rarely 21, rows, not or but scarcely longer than the ventrals, at least the median dorsals keeled in adults (probably all smooth in young); ventrals 187-211; anal divided; subcaudals 130-155 pairs.

Dentition. Maxillary teeth 18, subequal, followed after a diastema by 3 enlarged ones (Bogert, based on snakes from Kampala and Lukolela).

Anatomy. The hemipenes are described by Bogert, as follows: "Everted on the Lukolela specimen, single, sulcus undivided. Greatly enlarged basal spines decreasing in size distally and merging into fringed reticulate calyces at the end. The organ appears to be nearly identical with that of *T. flavigularis*." (*vide ante*).

Color. Above, in adults, uniformly black with a silken lustre; in halfgrown or young, dark brown or dark olive, the neck yellow with black-tipped scales and orange on the sides; dorsum chequered with black and yellow spots, the former predominating. Below, in adults, black, though paler than dorsum, uniform, or the throat yellowish, grayish, or brownish white; in halfgrown or young, chequered black and yellow on belly, with roundish yellow spots which are sometimes disposed alternately on the inner and outer part of successive subcaudals.

Size. Total length of ♂ (A.M.N.H. 12288), 1900 (1320 + 580) mm.; of ♀ (A.M.N.H. 12290), 2160 (1550 + 610) mm., both from the Belgian Congo (*vide* Schmidt).

Breeding. At Sipi and Butandiga on the western slopes of Mt. Elgon, four gravid females were taken between December 14, 1933 and January 11, 1934. The number of eggs varied from 7 to 12, average 9, and in size ranged from 19 x 8 mm. to 35 x 8 mm. (Loveridge).

Diet. Mammals, such as the tree rat (*Oecomys b. editus*), a bird, lizard (*Agama atricollis*) and chameleons (*C. senegalensis*, *C. b. bitaeniatus* and *C. b. höhnelii*) were found in their stomachs (Loveridge).

Parasites. Hemogregarines in Stanleyville snakes (Schwetz), and ticks on Uganda specimens (Pitman).

Defence. According to Christy this snake distends its neck like a cobra. If confirmed, it is probably achieved by inflation as is practised by the Boomslang (*Dispholidus typus*) to whose black phase *T. j. jacksonii* bears so striking a resemblance that it deceives even herpetologists. The snake described as *T. j. mossambicus* by Mertens, was only a Boomslang, whose grooved teeth were overlooked.

Habitat. Found in primary forest, being essentially an arboreal species.

Localities. **Belgian Congo:** Albertville; Avakubi; Bosabangi; Buta; Diambo; Eala; Kasai basin; Leopoldville; Lukolela; Medje; Niangara; Temvo (*vide* Witte); Upper Mulinga on Idjwi Id., Lake Kivu. **Tanganyika Territory:** Kabare near Bukoba. **Uganda:** Bundibugyo; Bussu; Butandiga; Entebbe; Fort Portal; Jinja; Kampala; Kilembe; ? Kitala; Mabira Forest; Sipi; Toro. **Kenya Colony:** Kaimosi; Kakamega; Kavirondo; Yala River.

Range. Central Belgian Congo east to western Tanganyika Territory and western Kenya Colony.

THRASOPS JACKSONII SCHMIDTI Loveridge

1911. *Thrasops rothschildi* Lönnberg (not Mocquard), p. 22.
 1912. Hobley, p. 49.
 1928j. *Thrasops jacksonii* Loveridge (part), p. 75.
 1923e. Loveridge, p. 879.
 1936f. *Thrasops jacksonii schmidti* Loveridge, Proc. Biol. Soc. Washington, 49, p. 63: Meru Forest, Mount Kenya, Kenya Colony.

Description. Rostral subquadrangular, about once and a third as broad as deep (in the middle), visible from above; nasal divided; internasals broader than long (in halfgrown), about as long as the prefrontals; frontal twice as long as broad (in the middle), longer than its distance from the rostral (halfgrown), as long as the parietals, as broad as a supraocular; loreal present; preocular 1, separated from the frontal; eye large, its diameter much greater than its distance from the mouth; postoculars 3, the lowest in contact with 2 upper labials; temporals 1 + 1; upper labials 8, the fourth and fifth entering the orbit; 4 or 5 lower labials in contact with the anterior sublinguals, which are shorter than the posterior. Midbody scales in 17 rows, not or scarcely longer than the ventrals, faintly keeled (in halfgrown); ventrals 170-178; anal divided; subcaudals 140-144 pairs.

Color. Above, in adults, uniformly black with a silken lustre; in halfgrown type, brownish olive. Below, in adults, black; in halfgrown type, grayish white becoming gray beneath tail with a median darker gray line posteriorly.

Size. Total length of type ♂ (M.C.Z. 9276), 1065 (700 + 365) mm. from Meru Forest; of ? ♀ (Nairobi Museum), 2255 (1671 + 584) mm. from Muthaiga. That is to say, almost $7\frac{1}{2}$ feet.

Localities. **Kenya Colony:** Meru Boma and Forest; Muthaiga, near Nairobi.

Range. Central Kenya Colony.

Genus DUBERRIA

1826. *Duberria* Fitzinger (part), Neue Class. Rept., p. 29 (type *Coluber canus* Linnaeus "und Consorten").

1830. *Homalosoma* Wagler, Syst. Amphib., p. 190 (n.n. for *Duberria*).

1894a. Boulenger, p. 274, fig. 19.

Maxillary short, with 10–12 teeth, subequal; anterior mandibular teeth longest. Head small, not distinct from neck; eye small, with round pupil; nasal entire or very rarely semidivided; loreal small or absent; 1, very rarely 2, preoculars. Body cylindrical, short; scales smooth, with apical pits, in 15, very rarely 16, rows; ventrals rounded. Tail short; subcaudals in two rows.

Range. East and Central Africa from Ethiopia and Uganda (chiefly in montane grasslands of equatorial belt) southwards to the Cape (but not recorded from Angola and South West Africa).

Remarks. Boulenger (1894a), who should be consulted for further generic synonymy, correctly followed Cope (1864) in using *Pseudaspis* Fitzinger (1843) for *Coluber canus* Linnaeus (1758) of which it was the genotype, thus *Duberria* Fitzinger (1826) was left unused. When proposing *Duberria*, Fitzinger included among its species *Coluber arctiventris* Daudin (1803) = *Coluber duberria* Merrem (1790) = *Coluber lutrix* Linnaeus (1758) which consequently becomes the type by tautonymy of the genus *Duberria*. *Homalosoma* was proposed by Wagler (1830) merely as a substitute name for *Duberria*, as is shown by his footnote 4 on p. 190.

Bogert (1940, p. 39) remarks that the anterior sixth of the maxilla is devoid of teeth or sockets, and that the maxillary teeth are more widely spaced than is usually the case with snakes. Like Peters (1882a, pl. xvi, fig. 1), he found 10 maxillary teeth, whereas Boulenger (1894a, fig. 19) shows 11 and gives from 10 to 12 in the text.

For various comments on the following *Key*¹, see Loveridge (1942e, pp. 279-280) where the following scale-counts are accepted.

<i>D. variegata</i>	Range of ventrals 97-110, subcaudals 25-36.
<i>D. l. lutrix</i>	Range of ventrals 120-134, subcaudals 25-51.
<i>D. l. shirana</i>	Range of ventrals 126-151, subcaudals 24-46.
<i>D. l. abyssinica</i>	Range of ventrals 118-149, subcaudals 17-39.

Key to the Species

1. Ventrals 97-110; postoculars 2; a loreal; belly reticulated black and white; range: Zululand northwards to Inhambane, Mozambique *variegata* (p. 147)
 Ventrals 118-151 2
2. Postoculars usually 2 (87%, 1 in 13%); a loreal (absent in 7%); belly yellowish in middle; range: highlands and lowlands of Africa south of the Zambesi *l. lutrix* (p. 144)
 Postocular usually single 3
3. Postocular 1 (85%, 2 in 15%); no loreal (100%); belly yellowish in middle rarely dark; range: highlands around Lake Nyasa and southern Tanganyika Territory *l. shirana* (p. 142)
 Postocular 1 (100%); a loreal (absent in 10%); belly usually very dark, rarely yellowish in middle; range: highlands of northeastern Tanganyika Territory and western Belgian Congo, north to Uganda and Ethiopia *l. abyssinica* (p. 139)

DUBERRIA LUTRIX ABYSSINICA (Boulenger)

1870. *Homalosoma lutrix* (not of Linnaeus) Blanford, p. 458.
 1896d. Boulenger, p. 642.
 1896. Tornier (part), p. 72 (little use has been made of this reference which contains misprints).
 1897. Tornier, p. 65.
 1902a. Boulenger, p. 446.
 1902b. Mocquard, p. 406.
 1909. Peracca, p. 172.
 1910a. Sternfeld (part), p. 22 (part text, not fig.).
 1912b. Boulenger, p. 332.
 1912b. Sternfeld, p. 385.
 1912c. Sternfeld, p. 271.

¹ Based on 56 *lutrix*, 50 *shirana*, and 53 *abyssinica* counts.

- 1915a. Boulenger (part), p. 208.
 1915c. Boulenger (part), p. 625.
 1915d. Boulenger (part), p. 650.
 1918a. Loveridge, p. 332.
 1923e. Loveridge, p. 880.
 1924b. Loveridge, p. 5.
 1925a. Angel, p. 33.
 1929h. Loveridge, p. 28.
 1930b. Barbour & Loveridge, p. 787.
 1933. Schouteden, p. 236.
 1933j. Witte, p. 123.
 1933m. Witte, p. 91.
 1934a. Schwetz, p. 381 (*lutrix*, misprint).
 1894a. *Homalosoma abyssinicum* Boulenger, Cat. Snakes Brit. Mus., 2, p. 276, pl. xiii, fig. 2: Lake Ashangi, Ethiopia.
 1908c. Sternfeld, pp. 240, 243.
 1910a. Sternfeld, p. 22.
 1912c. *Homalosoma lutrix* var. *atriventrīs* Sternfeld, Wiss. Ergebn. Deut. Zentral-Afrika-Exped. 1907-1908, 4, p. 271: Kissenje = Kisenyi, Belgian Ruanda.
 1933h. *Duberria lutrix shiranum* Loveridge (not Boulenger), p. 241.
 1936h. Loveridge, p. 34.
 1936. Pitman, p. 61, pl. vii, fig. 5, pl. H, fig. 1.
 1937d. Mertens, p. 7.
 1937. Uthmöller, p. 112.
 1938a. Pitman, pp. 211, 231.
 1938b. Pitman, pp. 116, 309, 329, pls. as above (reprint).
 1940. Bogert (part), p. 39 (Fort Portal specimen only).
 1940. *Duberria lutrix abyssinicum* Bogert, p. 40.

Names. Abyssinian Slug-eater; *bulifu* (Kiga).

Description. Rostral once and a third to once and three quarters as broad as deep, visible from above; nasal entire, very rarely semidivided; internasals broader than long, much shorter or about as long as the prefrontals; frontal once and a quarter to nearly twice as long as broad, longer than its distance from the end of the snout, as long as, or slightly longer or slightly shorter than, the parietals; once and a quarter to once and two thirds as broad as a supraocular; loreal small, rarely absent; preocular 1; eye moderate, its diameter greater than its distance from the mouth; postocular 1, rarely 2; temporals 1 + 2, rarely 1 + 1; upper labials 6, very rarely 5 or 7, the third and fourth, or very rarely the third only, or third, fourth and fifth, entering the orbit; 3, rarely 4, lower labials in contact with the anterior sublinguals, which are subequal with, or

shorter than, the posterior. Midbody scales in 15 (rarely 16¹) rows, smooth; ventrals 110-149²; anal entire; subcaudals 17-39² pairs.

Color. Above, dark olive or olive brown or blackish, usually a fine, more or less continuous, black vertebral line; sides dark, flecked with white. Below, usually deep gray-black, more or less variegated with lighter, throat sometimes yellow, this color rarely continued as a median stripe as far as the anal shield which may be spotted with yellow.

Size. Total length of ♂ (M.C.Z. 48354), 332 (281 + 51) mm. from Mushongero, Lake Mutanda; of ♀ (M.C.Z. 34921), 434 (384 + 50) mm. Lake Bunyoni.

Sexual dimorphism. Subcaudals of females range from 17-27, in males from 27-39. The latter figure, however, is an unsexed record of Sternfeld's, the highest count on an M.C.Z. male being 37.

Breeding. Eight out of thirteen Kigezi females examined between October and November, by Pitman, held from 6 to 12 eggs. Others examined in June and July by the same author were gravid. Four females from Nyakabande, Kigezi, examined on January 27, 1939, by Loveridge held, respectively, 7 eggs (measuring 12 x 9 mm.), 10 eggs (8 x 5 mm.), 11 eggs (14 x 7 mm.) and a fourth with large embryos. At Kabare, Bukoba, January 10, 1923, a female, though small (290 + 38 mm.), held 10 eggs (12 x 8 mm.). At Lulenga, Ruanda, March 1, 1927, a ♀ held at least two embryos, which were uniformly plumbeous above, blue-gray below, measuring ♂ 103 (86 + 17) mm., and ♀ 100 (85 + 15) mm.

Diet. Slugs in four Nyakabande snakes; eggs (*vide* Sternfeld) in stomach of type of *atriventrīs*.

Parasites. Worms were observed in Kigezi snakes by Pitman.

Temperament. Pitman (1938b, p. 118) writes: "Its general demeanour suggests inoffensiveness. I have caught and handled numerous specimens and very rarely have any attempted to bite. They are as a rule most docile, placid and friendly, and within a few moments of capture even the most frightened has become tame and confiding!" and adds that, though abundant, the Bakiga do not think it is harmless.

Habitat. Upland country (3,000 to 10,000 feet) with short grassy tussocks.

¹ Bogert (1940, p. 39) in a Fort Portal snake.

² Pitman's (1938b, p. 117) record of 151 ventrals and 46 subcaudals, rejected pending confirmation as possibly based on a native's counting.

Range. Highlands of Central Lake region northwest through Uganda to Ethiopia, south in highlands of Kenya and northern Tanganyika.

Localities. **Ethiopia:** Gara Mulata; Grau; Lake Ashangi; Webi Mana. **Uganda:** Bufundi; Fort Portal; Harutindo; Hoima to Kampala; Kisolo (Kissoro); Kitagueta; Lake Bunyonyi; Lake Chahafi; Mityana; Muko; Mushongero; Niwashenya, s. of Kishasha Valley; Nyakabande. **Kenya Colony:** ? Aberdare Mountains; Kinangop Plateau; Meru; Nairobi; Nyeri (Ndjiri). **Tanganyika Territory:** Amani; Arusha; Bukoba; Gomberi; Kabare, Bukoba; Kilema, Kilimanjaro Mountain; Kilimanjaro to Teita; Marungu; Moshi; Ngorongoro. **Belgian Ruanda:** Katana, Lake Kivu; Kisenyi; Lulenga; Volcano region. **Belgian Congo:** Boundary Mountains N. W. of Lake Tanganyika; Ngoma; Rutshuru; Stanleyville (*fide* Schwetz).

DUBERRIA LUTRIX SHIRANA (Boulenger)

1893. *Homalosoma lutrix* Günther (not Linnaeus), 1892, p. 555.
 1898. Johnston, p. 361a.
 1894a. *Homalosoma shiranum* Boulenger, Cat. Snakes Brit. Mus., 2, p. 276, pl. xiii, fig. 1: Shire Highlands, Nyasaland.
 1896a. Bocage, p. 103.
 1933h. *Duberria lutrix shiranum* Loveridge, p. 241 (but range wrong).
 1934. Pitman, p. 295 (lists only).
 1940. Bogert (part), p. 39 (exclude Portal specimen).

Further citations of '*shiranum*' will be found under *D. l. abyssinica*.

Names. Shire Slug-eater; *nyaluhereka* (Kinga); *isakani* (Nyakusa). But both Wakinga and Banyakusa consider this small snake to be the young of *Trimerorhinus t. tritaeniatas*.

Description. Rostral once and a half to twice as broad as deep; visible from above; nasal entire; internasals broader than long, shorter or longer or about as long as the prefrontals; frontal once and a quarter to once and a half as long as broad, longer than its distance from the end of the snout, as long as, or shorter than, the parietals; once and a half to twice as broad as a supraocular; loreal absent, very rarely present; preocular 1; eye moderate, its diameter greater than its distance from the mouth; postocular 1, rarely 2; temporals 1 + 2, rarely 1 + 1; upper labials 6, very rarely

7, the third and fourth, or very rarely the second, third and fourth, or third, fourth and fifth, entering the orbit; 3, rarely 2, lower labials in contact with the anterior sublinguals, which are subequal with, or shorter or longer than, the posterior. Midbody scales in 15 rows, smooth; ventrals 122-151; anal entire; subcaudals 24-47, pairs.

Color. Above, dark olive, olive brown, red brown or black, usually a fine, more or less continuous, black vertebral line. Below, sometimes deep gray black more or less variegated with lighter, sometimes the dorsal coloration extending on to the ventrals but leaving a median stripe of pale yellow or white down the centre.

Size. Total length of ♂ (M.C.Z. 30184), 379 (300 + 79) mm. from Mangoto, Ubena Mtns.; of ♀ (M.C.Z. 30174), 412 (362 + 50) mm. from Kigogo, Uzungwe Mtns.

Sexual dimorphism. Subcaudals in females range from 25-38, in males from 40-47. Length of tail included in total length from 4.2 to 5.1 times in males, from 6 to 9 times in females.

Breeding. From Rungwe Mountains, Bogert records females holding from 6 to 17 eggs, measuring from 8 x 7 to 13 x 6 mm. He does not observe much correlation between size of snake and the number of eggs produced; it seemed to me that the number increases with the size of the snake though doubtless waning with declining fertility in old individuals. Condensed, my records read: At Kigogo Uzungwe Mtns., January 23 & 30, 1930, seven females held 8 to 13 eggs, measuring from 9 x 6 to 12 x 8 mm., all the larger being on the later date. At Madehani, Ukinga Mtns., February 14, 1930, five females held from 7 to 12 eggs, one batch measured, being 10 x 6 mm. At Mangoto, Ubena Mtns., February 10, 1930, an evidently recently born young male measured 118 (93 + 25) mm.

Diet. Almost exclusively slugs, which are taken by even very young snakes. The only other food found, together with a slug, was a 125 mm. *D. l. shirana* in the stomach of a larger Madehani snake of the same species.

Parasites. Nematode worms in stomachs and intestines of Dabaga and Kigogo snakes.

Enemies. Cannibalistic as related above, though it is possible that the young snake was engaged in swallowing the slug and that this was the incentive for the larger snake to attack so that the engulfing of the young snake was only incidental!

Habitat. They like to bask on the grassy tussocks where their olivaceous color renders them inconspicuous, such tussocks occurred

on hillsides where hoeing by natives resulted in uncovering a good many, for on being disturbed these snakes seek refuge in the loose soil at the base of the tussocks. Others were found in rich, but short, grass in the marshlands of highland valleys.

In habitat then, as well as in diet, size, and a somewhat similar appearance, *D. l. shirana* fills a niche in the East African fauna similar to that occupied by *Storeria d. dekayi* in eastern North America.

Near Kigogo a settler, whose native employees were clearing land for planting coffee, informed me that "blind snakes" were very abundant, and that in digging a furrow forty feet in length they had destroyed over ninety of them! As I found no *Typhlops* in the Uzungwe Mountains I concluded that he referred to *Duberria*. In view of the great economic value of these snakes in a coffee plantation by reason of their diet of slugs they deserve protection by all intelligent settlers: the same applies to *Typhlops* which subsists almost entirely on termites with an occasional caterpillar or slug.

Localities. Tanganyika Territory: Dabaga; Ihanganya; Iloilo; Kigogo; Mangoto; Madehani; Rungwe Mountain; Tandala; Ugano. (All these localities being in the Matengo, Ukena, Ukinga, Uzungwe or Rungwe highlands). **Nyasaland:** Shire highlands.

Range. Highlands of southern Tanganyika Territory and Nyasaland.

DUBERRIA LUTRIX LUTRIX (Linnaeus)

- 1735. *Hydra zeylanica* Seba, Rerum Nat. Thesauri, **2**, p. 2, pl. i, fig. 6: "Ceylon".
- 1735. *Serpens eximia* Seba, Rerum Nat. Thesauri, **2**, p. 92, pl. lxxxvi, fig. 5: Africa.
- 1758. *Coluber lutrix* Linnaeus, Syst. Nat. ed. 10, **1**, p. 216: "Indiis."
- 1766. Linnaeus, **1**, p. 375 (275 misprint).
- 1788. Gmelin, **1**, p. 1086.
- 1790. *Coluber Duberria* Merrem, Beytr. Naturg., p. 7, pl. i: No locality (after Seba).
- 1801. *Elaps Duberria* Schneider, **2**, p. 297.
- 1802. *Coluber tetragonus* Latreille, Hist. Nat. Rept., **4**, p. 97: "? France."
- 1803c. Daudin, p. 207.
- 1803c. *Coluber arctiventris* Daudin, Hist. Nat. Rept., **7**, p. 221: n.n. for *duberria* Merrem.
- 1820. Kuhl, p. 82.
- 1804. *Coluber erathon* Hermann, Observat. Zool., p. 273: "India orientali."
- 1826. *Duberria arctiventris* Fitzinger, p. 55.
- 1830. *Homalosoma arctiventris* Wagler, p. 191.

1849. Smith, A., App., p. 16.
1837. *Calamaria arctiventris* Schlegel, **2**, p. 36, pl. i, figs. 24-26.
1854. *Homalosoma lutrix* Duméril & Bibron, **7**, p. 110.
1858. Günther, p. 20.
1862. Jan, **2**, p. 33.
1865. Jan, livr. 13, pl. iii, fig. 3.
- 1867a. Steindachner, p. 59.
- 1884a. Rochebrune, p. 152 (this is erroneous).
- 1885a. Müller, p. 142.
- 1887b. Boettger, p. 156.
- 1887h. Boulenger, p. 175.
- 1891a. Matschie, p. 609.
- 1894a. Boulenger, p. 274.
1896. Tornier (part), p. 72 (Cape material).
1898. Boettger, p. 77.
1898. Jeude, p. 35.
1898. Werner, 1896-7, p. 143.
1902. Lampe & Lindholm, p. 29.
- 1907a. Roux, p. 77.
- 1907c. Roux, p. 735.
- 1908b. Boulenger, p. 229.
1908. Gough, p. 25.
- 1909b. Chubb, p. 35.
- 1910b. Boulenger, p. 509.
- 1910a. Hewitt, p. 57.
- 1910a. Sternfeld (part), p. 22, fig. 25.
- 1910b. Sternfeld (part), p. 21, fig. 22.
1912. FitzSimons, F. W., p. 90.
1913. Hewitt & Power, p. 162.
1916. Andersson, p. 40.
- 1922c. Angel, p. 357.
1929. Rose, p. 152, fig. 97.
- 1929a. Werner (part), p. 150, fig. 44.
1935. Power, p. 334.
1868. *Cyclophis catenatus* Theobald, Cat. Rept. Asiatic Soc. Mus., p. 49:
"Simla, India."
1908. *Homalosoma shiranum* Gough (not of Boulenger), p. 25.
- 1933h. *Duberria lutrix lutrix* Loveridge, p. 242.
- 1939b. FitzSimons, V., p. 21.
1940. Bogert, p. 39.
- 1937e. *Duberria lutrix* Hewitt, p. 52.

Names. Russet Slug-eater (English); *rooislang* (Dutch).

Description. Rostral once and a third to nearly twice as broad as deep, visible from above; nasal entire; internasals broader than long,

about as long as the prefrontals; frontal once and a half to twice as long as broad, longer than its distance from the end of the snout, as long as, or slightly longer or slightly shorter than, the parietals, once and a half to twice as broad as a supraocular; loreal small, rarely transversely divided or absent; preocular 1, very rarely 2; eye moderate, its diameter greater than its distance from the mouth; postoculars 2, lower sometimes minute, or 1 only; temporals 1 + 2, rarely 1 + 1 or 1 + 2; upper labials 6, the third and fourth entering the orbit; 3, rarely 4, lower labials in contact with the anterior sublinguals, which are subequal with, or longer than, the posterior. Midbody scales in 15 rows, smooth; ventrals 120-144; anal entire, very rarely divided¹; subcaudals 24-51, pairs. (21-46 *vide* Boulenger).

Color. Above, brick red, reddish brown, pale brown, olive or yellowish, with or without a vertebral series of fine dark dashes; flanks gray or plumbeous, usually sharply distinct from dorsal coloring. Below, white, cream or yellowish, the outer edges of the ventrals gray, usually flecked or spotted with black.

Size. Total length of ♂ (M.C.Z. 42639), 364 (297 + 67) mm., from Port St. John; of ♀ (M.C.Z. 11921), 377 (322 + 55) mm., from Cape Town. Both surpassed by Boulenger's unsexed (?♂) record of 390 (325 + 65) mm.

Sexual dimorphism. In Museum of Comparative Zoölogy material the subcaudals of females range from 25-32², in males from 33-49.

Breeding. Viviparous, producing from 3 to 10 young in February (F. W. FitzSimons).

Diet. Mainly slugs (Rose), also snails, insects and their larvae (Hewitt).

Enemies. Two in gullet of Secretary Bird (*Sagittarius serpentarius*) (Anderson).

Defense. When alarmed, curls up like a roll of tobacco (Hewitt).

Habits. Slow-moving and, though not a burrower, highly secretive, being found in loose soil about the base of bushes, beneath fallen leaves and pine needles, and in dry grass (Smith, Rose, Hewitt).

Habitat. Common alike in the coastal districts of Cape Province and the high plateaux of the interior (Hewitt).

Localities. **Mozambique:** Rikatla. **Southern Rhodesia:** Bulawayo; Chirinda Forest. **Transvaal:** Barberton; Belfast; Haenertsburg; Irene; Johannesburg; Lydenburg; Mariepskop; Mphome;

¹ In Chirinda Forest specimen (Transvaal Mus. 16185), *vide* FitzSimons (1939b, p. 21).

² The alleged ♀ with 48 recorded by Bogert (1940, p. 39), proved on re-examination to have been a ♂, *vide* Bogert (letter of 17, VI, 40).

Potchefstroom; Pretoria; Sabi; Woodbush. **Zululand:** Melmoth. **Natal:** Durban; Hilton Road, Merebank. **Orange River Colony** (*fide* F. W. FitzSimons). **Cape Province:** Albany; Burghersdorp; Caledon; Cape Town; Ceres; Grahamstown; East London; Fransche Kraal; Kalk Bay; Knysna; Little Namaqualand; Malmsbury; Middleburg; Paarl; Port Alfred; Port Elizabeth; Port St. John; Sir Lowry's Pass; Stellenbosch; Table Mountain; Tokai.

Range. Africa south of the Zambesi exclusive of South West Africa and Angola.

DUBERRIA VARIEGATA (Peters)

1854. *Homalosoma variegatum* Peters, Monatsb. Akad. Wiss. Berlin, p. 622.
Inhambane, Mozambique.
1855. Peters, p. 51.
1882a. Peters, p. 107, pl. xvi, fig. 1.
1888d. Boulenger, p. 140.
1894a. Boulenger, p. 276.
1896a. Bocage, p. 93.
1898. Selater, p. 99.
1908b. Boulenger, p. 229.
1910b. Boulenger, p. 509.
1912. FitzSimons, F. W., p. 90.
1929a. Werner, p. 151.

Description. Rostral broader than deep, visible from above; nasal entire; internasals slightly longer than the prefrontals; frontal once and a half as long as broad, longer than its distance from the end of the snout, as long as the parietals; nearly twice as broad as a supra-ocular; loreal small; preocular 1; eye rather larger than in *lutrix*, its diameter greater than its distance from the mouth; postoculars 2; temporals 1 + 2; upper labials 6 or 7, the third and fourth or fourth and fifth entering the orbit; 3 lower labials in contact with the anterior sublinguals. Midbody scales in 15 rows, smooth; ventrals 97-110; anal entire; subcaudals 25-36, pairs.

Color. Above, dark or olive brown with three series of dark brown spots or irregular lichen-like brownish-white variegation. Below, reticulated black and white.

Size. Total length 250 (217 + 33) mm.

Sexual dimorphism. Subcaudals in a female were 25, in a male 36.

Remarks. In the absence of material, the foregoing is adapted from Boulenger (1894a, p. 276).

Localities. **Mozambique:** Delagoa Bay; Inhambane; Lorenzo Marques. **Zululand:** Mseleni.

Range. Mozambique to Zululand. (Senegambia in error by Rochebrune, 1884a, p. 152).

Genus THELOTORNIS

1849. *Thelotornis* A. Smith, Ill. Zool. S. Africa, **3**, App. p. 19 (type *capensis* Smith.)

1859. *Cladophis* A. Duméril, Arch. Mus. Hist. Nat. Paris, **10**, p. 204 (type *Leptophis kirilandii* Hallowell).

For further partial synonymy see Boulenger (1896d, p. 184).

Maxillary teeth 11–17, gradually increasing in size, followed after an interspace by 2–3 enlarged grooved fangs situated below the posterior border of the eye; anterior mandibular teeth strongly enlarged. Head distinct from neck, with strong canthus rostralis; eye large with horizontal pupil; nasal entire; 2, rarely 1 or 3, loreals; preocular. Body cylindrical; scales oblique, narrow, slightly keeled, with apical pits, in 19 rows, of which the vertebral is not enlarged; ventrals rounded. Tail long, subcaudals in two rows.

Range. Africa south of 15° N., i.e. Portuguese Guinea and northern South West Africa, east to Italian Somaliland and Natal.

Remarks. Boulenger (1896d, p. 185), from whom the above description is largely taken, with increase in range of maxillary teeth from Bogert (1940, pp. 69, 71), remarks that the ectopterygoid bone is forked, the two branches articulating with the maxillary; an arrangement which he states is unique among ophidia. Bogert describes the hemipenes for both races.

Schmidt (1923, p. 113) points out that: "The depressed and flat head, with the canthus rostralis distinctly projecting, forming a shallow loreal groove, is very characteristic, distinguishing the species at once from all other African snakes." In the field one is most likely to mistake it for the slender, vine-like, bush-climbing *Psammophis biseriatus*, and I have confused it with the more blunt-headed young of its near relative, *Dispholidus typus*, the latter being vinaceous colored with white labials.

Key to the Races

Rostral and anterior ends of nasals broadly visible from above; crown of head immaculate, labials more or less immaculate, neck crossbanded; range: Portu-

guese Guinea to northern Angola, east to southern Somaliland and¹ central Tanganyika Territory *k. kirtlandii*
(p. 149)

Rostral and anterior ends of nasals narrowly visible from above; crown of head speckled with black, labials heavily speckled with black, neck not crossbanded though black lateral blotches usually present; range: central Angola and¹ northern South West Africa, east to central Tanganyika Territory and Natal.
k. capensis (p. 154)

THELOTORNIS KIRTLANDII KIRTLANDII (Hallowell)

- 1844. *Leptophis Kirtlandii* Hallowell, Proc. Acad. Nat. Sci. Philadelphia, p. 62: Liberia.
- 1854a. *Oxybelis Lecomtei* Duméril & Bibron, Erpét. Gén., 7, p. 821: Gaboon.
- 1854a. *Tragops rufulus* Duméril & Bibron, Erpét. Gén., 7, p. 827: Senegal.
- 1854a. *Dryophis Kirtlandi* Hallowell, p. 100.
- 1858c. ²Günther, p. 156.
- 1863a. Günther, p. 22.
- 1866a. Bocage, p. 48.
- 1869. Jan, livr. 32, pl. vi. fig. 2.
- 1885d. Müller, p. 684.
- 1886. Martinez y Saez, p. 339.
- 1888a. Boettger, p. 65.
- 1889. Hesse, p. 267.
- 1889. Mocquard, p. 145.
- 1893. Prato, p. 13.
- 1895a. Bocage, p. 119.
- 1895c. Bocage, p. 13.
- 1903a. Bocage, p. 44.
- 1856b. *Oxybelis violacea* Fischer, Abhand. Nat. Ver. Hamburg, 3, p. 91, pl. ii, fig. 7: Edina, Grand Bassa County, Liberia.
- 1857. *Oxybelis Kirtlandii* Hallowell, p. 59.
- 1859. *Cladophis Kirtlandii* Duméril, p. 204, pl. xii, fig. 8.
- 1874. Reichenow, p. 292.
- 1867b. *Thelotornis kirtlandii* Peters, p. 235.
- 1875a. Peters, p. 199.
- 1884a. Fischer, p. 11.
- 1884a. Rochebrune, p. 178 (ignored).
- 1890. Büttikofer, p. 478.
- 1892. Matschie, p. 110.

¹ It should be borne in mind that Angola and Tanganyika are areas of intermediates and that an occasional lowland specimen in the Voi region of southeast Kenya may preponderate in *capensis* attributes.

² This, and some of the following, were spelt *Dryiophis*.

- 1893c. Matschie, p. 212.
1893. Prato, p. 13.
1893b. Stejneger, p. 733.
1896d. Boulenger (part), p. 185.
1896. Tornier (part), p. 83.
1897b. Boulenger, p. 279.
1897g. Boulenger, p. 279.
1897. Sjöstedt, p. 35.
1897. Tornier, p. 65.
1898. Boettger, p. 107.
1898a. Werner, p. 209.
1899a. Werner, p. 140.
1900b. Boulenger, p. 454.
1900. Ferreira, p. 52.
1901b. Tornier, p. 64.
1902a. Boulenger, p. 447.
1902a. Werner, p. 345.
1905f. Boulenger, p. 185.
1906i. Boulenger, p. 214.
1906. Johnston, p. 832.
1907. Lönnberg, p. 16.
1908a. Sternfeld, pp. 413, 428.
1908b. Sternfeld, pp. 219, 233.
1909a. Sternfeld, p. 21, fig. 33.
1909b. Sternfeld, p. 21, fig. 28.
1910. Müller, p. 607.
1910a. Sternfeld (part), p. 31, fig. 34.
1911. Lampe, p. 201.
1911b. Nieden, p. 442.
1911a. Sternfeld, p. 251.
1912. Hobley, p. 52.
1913. Lönnberg & Andersson, p. 4.
1913a. Werner, in Brehm, p. 403, pl. viii, fig. 3.
1915a. Boulenger (part), p. 213.
1915c. Boulenger (part), p. 631.
1915d. Boulenger (part), p. 654.
1916a. Loveridge, p. 86.
1918a. Loveridge, p. 327.
1919b. Boulenger (part), p. 290.
1919g. Boulenger, p. 26.
1921a. Chabanaud, p. 471.
1921b. Chabanaud, p. 525.
1921b. Noble, p. 168, fig.
1922. Aylmer, pp. 15, 21.
1923e. Loveridge (part), p. 887.

1923. Schmidt, p. 112, pl. xiv.
 1924b. Loveridge (part), p. 7.
 1925. Werner, 1924, p. 131, fig. 5.
 1927. Calabresi, p. 56.
 1927c. Power, p. 410.
 1927d. Witte, p. 325.
 1928c. Barbour & Loveridge, p. 128.
 1928g. Loveridge (part), p. 34.
 1929h. Loveridge, p. 33.
 1930a. Barbour & Loveridge, p. 773.
 1933f. Angel (part), p. 165, figs. 62, 62a.
 1933m. Witte, p. 94.
 1934a. Schwetz, p. 382.
 1934c. Scortecci, p. 70, fig. 30.
 1936h. Loveridge (part), p. 39.
 1936j. Loveridge, p. 265.
 1936c. Parker, p. 125.
 1937c. Loveridge, p. 277.
 1937f. Loveridge, pp. 493, 496, 503.
 1937. Pitman (part), p. 242, pl. xi, fig. 5.
 1937. Uthmüller, p. 120.
 1938a. Pitman, pp. 216, 233.
 1938. Uthmüller, p. 45.
 1939a. Scortecci, p. 283.
 1939c. Scortecci (part), p. 159, figs. 88-89.
 1940. Bogert, p. 69, fig. 10.
 1942b. *Thelotornis kirtlandii capensis* Bogert (intermediates), p. 2.
 1942e. *Thelotornis kirtlandii kirtlandii* Loveridge, p. 292.

Further citations of '*kirtlandii*' will be found under *k. capensis*.

Names. Western Bird Snake or Vine Snake (English); *bokarrabai* (Temne: Sierra Leone: Aylmer); *mbeya* (Wamba: Uganda: Loveridge); *mraringa* (Teita: Kenya: Loveridge); *lukukuru* (Kami: Tanganyika: Loveridge); *kawaikukoto* (Cazengo region, Angola: Ferreira).

Description. Rostral about once and three-quarters to twice as broad as deep, strongly recurved on snout so broadly visible from above; nasal entire, its anterior end reaching upper surface of snout; internasals about as broad as long, as long as or shorter than the prefrontals; frontal semi-bell-shaped, twice to thrice as long as broad (in the middle), as broad as, or narrower or broader than, a supraocular, as long as, or slightly shorter or longer than, its distance from the end of the snout, as long as, or slightly shorter than, the parietals; loreals 2, sometimes 1 or 3 (or absent *fide* Hallowell); preocular 1; eye very large,

its diameter much greater than its distance from the mouth; postoculars 3, rarely 2, the lowest in contact with 2 upper labials; temporals 1 + 2, very rarely 2 + 2; occipitals 2, separated by 1, 2, or 3 smaller shields; upper labials 8, rarely 7 or 9, the fourth and fifth, or third, fourth and fifth, or fifth and sixth, entering the orbit; 4, rarely 3 or 5, lower labials in contact with the anterior sublinguals, which are usually much shorter than, though sometimes as long as, the posterior. Mid-body scales in 19¹ rows which are narrow, very oblique, and feebly keeled; ventrals 153–189; anal divided; subcaudals 137–175 pairs.

Color. Above, head green, uniform, lips cream-colored or pink, uniform (in west) or slightly flecked with black (in east); dorsum pinkish brown speckled and striated with brown, anteriorly heavily crossbarred with black. Below, vinaceous, gray or white, speckled or striated with brown. Iris golden (Reichenow). Tongue bright red with a black tip (A.L.).

Size. Total length of ♂, 1422 (821 + 601) mm., from Mount Mbololo, Kenya Colony; total length of ♀, 1478 (919 + 559) mm. from Morogoro, Tanganyika Territory.

Remarks. Dr. Dunn (7. x. 1940) tells me that the type of *kirtlandii* cannot be located in the Academy of Natural Sciences of Philadelphia. Only in recent times has the Southeastern Bird Snake been definitely accepted as a recognizable geographical race. In this account an attempt has been made to carefully allocate all available data to its correct subspecies.

Dentition. The number of teeth anterior to the three enlarged fangs vary from 11 to 14 according to Bogert (1940, p. 70) whom see for further discussion.

Anatomy. For a full description of the hemipenes of four Congo snakes, in which they extended to the sixth subcaudal only, see Bogert (1940, p. 70).

Breeding. On October 4, a Nyange ♀ held 5 eggs, each measuring 15 x 15 mm. On January 16, a Morogoro ♀ laid 8 eggs, each measuring 27 x 15 mm.

Diet. Actually birds seem less frequently an article of diet than arboreal lizards or snakes. A green snake (*Chlorophis carinatus*) has been found in a Lukolela specimen (Bogert); while at Nyange, a captive Bird Snake ate a *Chlorophis neglectus*, *Neusterophis o. uluguruensis* and *Crotaphopeltis h. tornieri*, and apparently the same fate befell an Egg-eater (*Dasypeltis s. medici*) that shared the cage. At

¹ My (1929b, p. 33) count of 15 is erroneous, as also Hallowell's (1854, p. 10) of 13, and Uthmoller's (1934, p. 120) of 17. Their oblique nature often makes an accurate count difficult.

Bundibugyo an *Agama atricollis* was recovered from a Bird Snake, while a Buta specimen was found to have swallowed a skink (*Mabuya m. maculilabris*) and two large nestlings of a weaver (*Spermophaga*).

When the Bird Snake seized the large Tornier's Snake it held on doggedly, occasionally chewing with its poison fangs. The Tornier's Snake felt about with its tail for twigs or branches on which to get a purchase. After eight minutes spent in this way the Bird Snake tried to swallow and was then observed to be in difficulties; the Tornier's Snake had hooked its teeth into the mucous membrane of the Bird Snake's mouth. I intervened and separated them whereupon the Tornier's Snake tried to make off, but the Bird Snake — which had itself withdrawn — returned swiftly, seized its victim, and began to swallow again. The Tornier's Snake, being a large one as I have said, resulted in an unusually laboured deglutition. In all it took an hour from the moment when the Tornier's Snake was first seized until the last of it disappeared.

Parasites. Nematode in a Lukolela snake (Bogert), and fragment of a cestode in one from Nyange (Loveridge).

Defence. The first line of defence of this remarkably vine-like reptile is cryptic. Partly lying along a branch about which its tail is entwined, the Bird Snake projects its anterior third far into space and so remains rigidly motionless except, perhaps, for an occasional flicker of its black-tipped, scarlet tongue. The bright green top of its somewhat leaf-shaped head assists in the illusion, for the Bird Snake furnishes one of the finest examples of cryptic coloring to be found among African snakes.

When molested, however, prior to lunging, the snake assumes a most threatening attitude, being able, like the Boomslang, to vertically inflate its anterior third to a surprising extent. This is made possible by the cartilaginous rings, which support the trachea, being incomplete dorsally. The result of this inflation is to accentuate the brighter coloring of the distended neck, particularly the broad black crossbands. Müller (1910, p. 608), who has given an excellent account of this behavior, states that the excited snake also extends its strangely colored tongue to the fullest extent, the shiny black tips closely applied together, or spread so widely apart as to form an angle of 180° .

Habitat. Though essentially an arboreal species, it seems reasonable to suppose that even the western form descends to the ground at times in search of prey.

Localities. **Portuguese Guinea.** French Guinea: Beyla. **Sierra Leone.** Liberia: Edina; Gbanga. **Gold Coast:** Adjah

Bippo; Ashanti; Fantee. **Togoland**: Misahöhe. **Nigeria**: Ifo, Ondo Province; Oil River. **British Cameroon**: Johann Albrechtshöhe; Victoria. **French Cameroon**: Bipindi; Bitye; Dibongo near Edea; Ja River; Jossplatte; Kribi; Longji. **Spanish Guinea**: Benito River; Corisco; Elobey district. **Fernando Po**: Bahia de S. Carlos. **French Congo**: Gaboon; Loango Mouth; Loudinia-Niari. **Belgian Congo**¹: Akenge; Avakubi; Banana; Basongo; Buta; Dika; Elisabethville; Epulu Ferry; Ganda Sundi in Mayumbe; Kanzenze; Kasai Kunungu; Lukolela; Mayon; Mayumbe; Niangara; Niapu; Nyampoko; Poko; Povo Nemlao; Pove Netonna; Saidi's Village; Stanleyville; Vube. **Angola**²: Cazengo; Duque de Braganca; Quirimbo (For southern localities see *T. k. capensis*). **Uganda**: Budongo Forest; Bundibugyo; Entebbe; Fort Portal; Jinja; Lutoto Hill in w. Ankole. **Italian Somaliland**: Belet Amin; Kismayu; Mofi. **Kenya Colony**: Jilore; Kilibassi;³ Mt. Mbololo; Sokoki Forest; Tana River; Taveta; Teita Mtns.; Voi³. **Tanganyika Territory**:² Arusha; Dunda on Kingani River; Kilimanjaro Mtns. Gomberi and Kibonoto; Marangu; Morogoro; Tumbanati; Uleia; Uluguru Mtns. Nyange and Vituri; Usambara Mtns. Amani, Derema, and Mlalo near Ambangula.

Range. Tropical Africa from Portuguese Guinea to northern Angola, east through Uganda and Kenya to Italian Somaliland and south to central Tanganyika Territory.

THELOTORNIS KIRTLANDII CAPENSIS Smith

- 1849. *Thelotornis capeusis* A. Smith, Ill. Zool. S. Africa, 3, App., p. 19: Kaffirland and the country towards Port Natal.
- 1940. Bogert, p. 70, fig. 11.
- 1854. *Oxybelis Lecomtei* Peters (not Duméril & Bibron), p. 623.
- 1855. Peters, p. 52.
- 1881b. *Dryophis Oatesii* Günther, in Oates, Matabeleland & Victoria Falls App., p. 330, pl. D.
- 1889a. Günther, p. 337, pl. D. (*Dryophis*).
- 1894a. Günther, p. 618.
- 1898. Johnston, p. 361a.

¹ Some of these in the southern Congo may be referable to the race *capensis*.

² For further localities see those listed under the race *capensis*.

³ Though characters of the Voi and Kilibassi specimens are preponderatingly *capensis*, crown of head is immaculate.

- 1882a. *Thelotornis Kirilandii* Peters (not Hallowell), p. 131, pl. xix, fig. 2.
 1890b. Boulenger, p. 93.
 1891a. Boulenger, p. 307.
 1896d. Boulenger (part), p. 185.
 1896. Tornier (part), p. 83.
 1897e. Boulenger, p. 801.
 1897. Tornier (part), p. 65.
 1898. Johnston, p. 361a.
 1898. Slater, p. 100.
 1898. Werner, 1896-7, p. 146.
 1899a. Mocquard, p. 219.
 1907a. Boulenger, p. 11.
 1907j. Boulenger, p. 487.
 1908b. Boulenger, p. 229.
 1908. Chubb, p. 221.
 1908. Gough, p. 32.
 1908b. Mocquard, p. 558.
 1908c. Sternfeld, p. 246.
 1909a. Chubb, p. 596.
 1909b. Chubb, p. 36.
 1910b. Boulenger, p. 515.
 1910. Peracca, p. 4.
 1910a. Sternfeld (part), p. 31.
 1910b. Sternfeld, p. 29, fig. 33.
 1910c. Sternfeld, p. 56.
 1912. FitzSimons, F. W., p. 126.
 1912. Peracca, p. 6.
 1913. Hewitt & Power, p. 164.
 1915a. Boulenger (part), p. 213.
 1915c. Boulenger (part), p. 631.
 1915d. Boulenger (part), p. 654.
 1915. Breijer, p. 113.
 1915c. Werner, p. 363.
 1919b. Boulenger (part), p. 290.
 1921a. Angel, p. 42.
 1923e. Loveridge (part), p. 887.
 1924b. Loveridge (part), p. 7.
 1928. Cott, p. 953.
 1928d. Loveridge, p. 56.
 1928g. Loveridge (part), p. 34.
 1931. Monard, p. 106.
 1931. Power, p. 48.
 1933f. Angel (part), p. 165.
 1933h. Loveridge, p. 257.
 1934. Pitman, p. 297.

1935. Cott, p. 969.
 1935. Cunha, p. 11.
 1936h. Loveridge (part), p. 39.
 1937a. FitzSimons, V., p. 274.
 1937b. Monard (part), pp. 128, 135.
 1937a. Parker, p. 630.
 1937. Pitman (part), p. 242, col. pl. L, fig. 3.
 1939b. FitzSimons, V., p. 23.
 1939c. Scortecchi (part), p. 159.
 1941. Moreau & Pakenham, p. 108.
 1887h. *Dryophis kirtlandii* Boulenger (not Hallowell), p. 177.
 1893. Pfeffer, p. 86.
 1895. Jeude, p. 229.
 1895a. *Dryophis Kirtlandii* var. *mossambicana* Bocage, Herp. Angola Congo, p. 119: Manica, Mozambique (restricted).
 1913. *Thelotornis kirtlandi* var. *capensis* Boettger, p. 345.
 1927. *Theborius Kirtlandii* (sic) Wyllie, p. 129.
 1937b. *Thelotornis kirtlandii capensis* Mertens, p. 14.
 1942e. Loveridge, p. 294.

Further citation of '*capensis*' will be found under *k. kirtlandii*.

Names. Southeastern Bird Snake or Vine Snake (English); *nondo* (Rungu: Tanganyika); *lukungu* (Nyika: Tanganyika); *nalakutu* (Yao at Dodoma); *lukukuti* (Yao at Kitaya, Tanganyika); *lukukutu* (Konde: Tanganyika); *likukutu* (Mawiha: Tanganyika: all Loveridge); *injarucucutue* (Sena: Mozambique: Peters); *nhariucuto* (Sena: Mozambique: Cott); *cucuta* (Quando, Angola: Anchieta); *nhocamenha* (Bibala, Angola: Bocage); *kalakukwiti* (N. Rhodesia: Neave); *ukotikoti* (Matabele: S. Rhodesia: Chubb); *vogelvreter slang* (Dutch: F. W. FitzSimons).

Description. Rostral about once and a quarter to twice as broad as deep, strongly recurved on snout so moderately or narrowly visible from above; nasal entire, its anterior end not, or but scarcely, reaching upper surface of snout; internasals about as broad as long, or longer than broad, as long as, or shorter or longer than, the prefrontals; frontal semi-bell-shaped, twice to twice and a half as long as broad (in the middle), as broad as or narrower than a supraocular, as long as, or slightly shorter or longer than, its distance from the end of the snout, as long as or slightly shorter than, the parietals; loreals 2, sometimes 1; preocular 1; eye very large, its diameter much greater than its distance from the mouth; postoculars 3, rarely 2 or 4, the lowest in contact with 2 upper labials; temporals 1 + 2; occipitals 2, separated by a smaller shield; upper labials 8, the fourth and fifth, or rarely the third and

fourth, entering the orbit; 4, rarely 5, lower labials in contact with the anterior sublinguals, which are usually shorter than the posterior. Midbody scales in 19 rows which are narrow, very oblique, and feebly keeled; ventrals 147–170; anal divided; subcaudals 131–166 pairs.

Color. Above, head of young pink, uniform, of adult green or pinkish brown flecked or speckled with darker, a brownish black-dotted band passing through the eye, an oblique streak below the eye on the upper lip which is cream or pink speckled with dark brown or black; dorsum pinkish brown or gray above, uniform or with blotches and striations and one or more black streaks on the nape. Below, vinaceous or gray speckled and striated with brown.

Size. Total length of ♂, 1453 ($875 + 578$) mm. from Nchingidi, Tanganyika Territory; total length of ♀, 1348+ ($933 + 415+$) mm. from Zengeragusu, Tanganyika Territory; both, however, exceeded by an unsexed specimen of 1470+ ($935 + 535+$) mm. from Caconda, Angola.

Remarks. The type of *capensis* cannot now be located (V. Fitz-Simons, 1937a).

Dentition. The number of teeth anterior to the three enlarged fangs vary from 11 (Hanha) to 16 (Rungwe) according to Bogert (1940, p. 71) whom see for further discussion.

Anatomy. For a full description of the hemipenes of two Hanha and Mlanje snakes, in which they extended to the ninth subcaudal, see Bogert (1940, p. 71) who also comments on the binocular vision attributed to this species by Walls (1932, p. 69).

Breeding. On December 24, at Zengeragusu, a ♀ laid 2 eggs, measuring 38×15 and 34×14 mm., respectively, which were dry when found; but for her escape the following day she might have laid more.

Diet. Only one snake of many examined, held feathers, apparently those of a weaver or finch. The Zengeragusu snake, confined with a *Typhlops s. excentricus*, allegedly swallowed the latter, according to the native in charge of them. Some weeks after her escape she was located in a tree only two hundred yards from the house, in her stomach was a recently swallowed chameleon (*C. d. dilepis*). Bogert (1940, p. 71) records finding a chameleon (*Brookesia platyceps*) in each of two Rungwe snakes, and two small terrestrial toads in a snake from Hanha. At Nchingidi two snakes each held a toad (*Breviceps mossambicus*).

Parasites. Cestode in a Northern Rhodesian snake (Pitman).

Defence. See account under typical form, and also that of Cott (1935, p. 969) with special reference to its cryptic coloration.

Migration. Mr. E. Wyllie, a surveyor who had spent many years in the veld, states (1927) that: "a number of these snakes" followed two days later by "a second contingent" passed through his camp on the Pongola River, Piet Retief District, travelling in a northwesterly direction. Never before had he witnessed snakes travelling "*en masse*."

Habitat. Boulenger (1897e) has stated that Bird Snakes occur on the Nyika Plateau between 6,000 and 7,000 feet. Pitman (1937) remarks on its occurrence from 1,500 feet in the Zambezi Valley to 5,000 feet on the plateau. He also invites attention to the frequency with which he has encountered this arboreal reptile upon the ground. As a savanna species in the East and South, from sea level upwards, it is obvious that it must make its way from tree to tree by means of the ground. Bogert (1940, p. 72) discusses at length the alternatives as to whether *Thelotornis* originated in the western rain forest and then spread to the savanna — the most reasonable view it seems to me — or else whether *capensis* represents a stage in the evolution of *kirtlandii*. The assumption of the absence of intergrades, however, is fallacious, being made in the absence of a good series of Tanganyika snakes.

At Kitungulu I obtained a Bird Snake under rather unusual circumstances. In a native clearing stood two huge trees about whose bases were piled quantities of dry grass. As the situation appeared ideal for cobras, I had the heap ignited. The heat from the flames rose into the trees though the flames fell far short; towards the end of the conflagration the Bird Snake dropped from a height of at least twenty feet. Though I saw it fall I mistook it for a branch till a shout from one of my "boys" drew my attention to the departing snake which I pursued and captured among the standing maize.

Localities. **Tanganyika Territory**¹: Kitaya; Kitungulu; Kondo Irangi; Lake Victoria; Marangu; Mikindani; Mpwapwa; Nchingidi; Rungwe Mtn.; Sanya; Uleia; Zengeragusu. **Mafia Island.** **Mozambique:** Cabaceira Id.; Cheringoma Farm, Inhaminga; Chifumbazi; Delagoa Bay; Fambani; Inguenha, Maputa; Loangwa Valley; Lumbo; Manica; Massangulo; Ngaza; Querimba Id.; Quilimane; Sena; Tete. **Nyasaland:** Lake Nyasa; Mandala; Mlanje (Milanji); Nyika Plateau; Shire Highlands; Zomba. **Northern Rhodesia:** Barotze; Batoka; Broken Hill to Bwana Mkubwa; Feira district; Loangwa Valley; Mpika; Mumbwa; Mwengwa on Kafue River; Namwala; Petauke; Serenje; Upper

¹ For further localities see those listed under the typical form.

Zambezi. **Southern Rhodesia:** Bulawayo; Chirinda Forest; Eldorado; Empandeni; Gwena's, Gwanayaya River; Irome; Khami; Matabeleland; Zambesi. **Bechuanaland Protectorate:** Lealui; Lobatsi (reported). **Transvaal:** Banolierkop; Comati and Crocodile Rivers junction; Dwar's River, Zoutpansberg district; Legogot; Louw's Creek; Malta near Leysdorp; Mariepskap; Mmoouve, 42 miles N. of Serowe; Piet Retief district; Pretoria; Zoutpansberg. **Zululand:** Hlabisa; Kosi Bay; Mseleni; Somkele; Ubombo. **Natal:** Country towards Port Natal; Durban; Umvoti River. **Cape Province:** Francistown. **South West Africa:** Gobabis; Grootfontein. **Angola**¹: Bibala; Caconda; Chimpopo; Cunene River; Hanha; Kuvangu; Quando River; Quilengues; Querimbo; Quissangue; Vila da Ponte.

Distribution. Africa south of the equator from central Angola and northern South West Africa, east to central Tanganyika Territory and Natal.

Folklore. An Myeye of Tabora voiced the belief that the species was not vicious, but that it would bite if trodden upon and that then the victim would die in a minute (Loveridge, 1928d). Pitman (1937) directs attention to local names in Northern Rhodesia such as: "the little bit of wood which bites," and "he who has been bitten can get as far as to see the roofs of his village but no farther before he dies." Wyllie (1927) was told by natives of the Piet Retief district, Transvaal, that this snake was very dangerous, averring that it licks its victim — ox, goat, or man — instead of striking. This results in the skin peeling off and the exposed tissue becoming septic leads to the demise of the victim.

Genus CALAMELAPS

1849. *Choristodon* A. Smith (not Jonas), Ill. Zool. S. Africa, **3**, App. p. 18 (type *concolor* Smith).
 1866a. *Calamelaps* Günther, Ann. Mag. Nat. Hist. (3), **18**, p. 26 (type *Calamaria unicolor* Reinhardt).

Maxillary very short with 3–4 teeth gradually increasing in size, followed after an interspace by a large grooved fang situated below the eye; anterior mandibular teeth enlarged. Head small, not distinct from neck; eye minute, with round pupil; nasal entire² or divided, in

¹ For further localities see those listed under the typical form.

² Tornier (1901a) states that in young examples of *C. u. unicolor* the nasal is entire, becoming semidivided or divided with growth. He mentions one individual in which the nasal is entire on one side of the head, divided on the other.

contact with the rostral; no loreal; no preocular. Body cylindrical; scales smooth, without pits, in 17–21¹ rows; ventrals rounded. Tail very short; obtuse, subcaudals in two rows.

Range. Africa from Portuguese Guinea and Angola east to Kenya Colony and Natal.

Remarks. Apparently the rostral develops with age, as in *Prosymna*; it is not distinguishable from that of *Rhinocalamus* and should therefore be avoided as a key character.

Key to the Species

1. Frontal as long as, or shorter than, its distance from the *rostral*; temporals 1 + 1; upper labials 7; fifth lower labial largest; posterior sublinguals as long as, or almost as long as, the anterior; ventrals 133–148; range Natal. *concolor* (p. 161)
 Frontal as long as, or longer than, its distance from the end of the *snout*; temporal 1 only; upper labials 6 or 5; fourth lower labial largest; posterior sublinguals often scarcely differentiated, if distinct then much shorter than the anterior; ventrals 161–194; unknown in Natal. 2
2. Midbody scales in 21 rows; range Angola and Transvaal north to extreme southwestern Tanganyika Territory (at Tukuyu nr. Lake Nyasa). *u. polylepis* (p. 162)
 Midbody scales in 19 to 15 rows. 3
3. Midbody scales in 19 rows; range Zululand, north along coast to Kenya Colony (at Ngatana, Tana River), penetrating inland in Transvaal (to Gravelotte) in Southern Rhodesia; (to Aatosma, and Empandeni where it meets with *polylepis*) and in Northern Rhodesia (to Lake Bangweulu). *w. warreni* (p. 163)
 Midbody scales in 17 to 15 rows. 4
4. Midbody scales in 17 rows; range Tanganyika Territory (Uluguru Mtns.) north to Kenya Colony (at Peccatoni, *vide* Boettger) west to Sierra Leone and "Guinea". *u. unicolor* (p. 165)
 Midbody scales in 15 rows; range Portuguese Guinea (Rio Cassine, known only from the type). *u. feae* (p. 168)

Sexual dimorphism. The marked dimorphism in the number of subcaudals in the races of *unicolor* is best shown in tabular form. It is

¹ Said to be 13 in type of *C. concolor* but considered erroneous by FitzSimons (1937a).

important to note, however, that *the sexes have had to be assumed in the case of polylepis* as authors have not furnished the sex, moreover, though Boulenger stated that the type of *feae* was a ♂, from the scale-counts it would appear to be a ♀.

	♂♂.	♀♀.	♂♂.	♀♀
<i>C. u. polylepis</i>	163-194,	197-212	ventrals;	27-27, 16-20 subcaudals
<i>C. u. warreni</i>	161-177,	179-209	ventrals;	26-30, 17-32 subcaudals
<i>C. u. unicolor</i>	164-182,	201-208	ventrals;	28-38, 21-27 subcaudals
<i>C. u. feae</i>	196,		ventrals;	23 subcaudals

CALAMELAPS CONCOLOR (Smith)

1849. *Choristodon concolor* A. Smith, Ill. Zool. S. Africa, **3**, App., p. 18:
Kaffirland eastward of Cape Colony, i.e. Natal.
- 1897h. Boulenger, p. 175.
- 1896d. *Calamelaps concolor* Boulenger, p. 246.
1898. Sclater, p. 100.
- 1910b. Boulenger, p. 516.
1912. FitzSimons, F. W., pp. 127, 128.
1925. Werner, 1924, p. 151.
- 1937a. FitzSimons, V., p. 263.
- 1905a. *Calamelaps Mironi* Mocquard, Bull. Mus. Hist. Nat. Paris, **11**, p. 77: Upper Natal.
1925. Werner, 1924, p. 151.

Further citations of "*concolor*" will be found under *u. unicolor* and *u. polylepis*.

Name. Purple-glossed Snake (English).

Description. Rostral nearly twice as broad as deep, the triangular portion visible from above included once and a half to two times in its distance from the frontal; nostril in a semidivided or divided nasal; internasals much broader than long, their median suture half to two-thirds the length of that of the prefrontals; frontal as long as broad (in the middle), shorter than its distance from the rostral, much shorter than the parietals; supraocular small; no loreal¹; no preocular; eye small, its diameter only half its distance from the mouth; postocular small, sometimes fused with the supraocular; temporals 1 + 1; upper labials 7, the third and fourth entering the orbit, third in contact with the prefrontal, fifth largest and in contact with the parietal; fourth lower labial largest; 4 lower labials in contact with the anterior sub-

¹ The frenal mentioned by Smith, is the posterior nasal.

linguals, which are slightly longer or shorter than the posterior. Mid-body scales in 17¹ rows, smooth; ventrals 133²-148; anal divided; sub-caudals 32-39.

Color. Above and below uniformly black (fading to brown in alcoholic specimens exposed to sunlight) except for the ventrals some, or all, of which may be margined with white posteriorly.

Size. Total length of ♂ (type of *mironi*), 442 (367 + 75) mm., from Upper Natal; total length of ♀ (M.C.Z. 16163), 348 (303 + 45) mm. from Durban, Natal.

Remarks. The alleged type in the Royal Scottish Museum has been discussed by FitzSimons (1937a) who finds that it has 17 (instead of 13 as stated by Smith) midbody scale-rows. Smith's misprint resulted in the description of *mironi* by Mocquard (1905a) subsequently synonymized by Boulenger (1910b). Chubb's (1909b) record of *concolor* from Southern Rhodesia was shown by Hewitt (1913e) to have been based on a misidentified *C. u. polylepis*. My own (1928g) reference to *concolor* was a lapsus for *unicolor*.

The third known specimen (M.C.Z. 16163) of this rare snake was received from the Albany Museum in 1922, identified as *Macrelaps microlepidotus*, a species readily distinguishable by its more numerous midbody scale-rows, which number 25 to 27.

Habitat. A burrowing snake, easily mistaken for the burrowing viper (*Atractaspis bibronii*) found in the same locality, Durban.

Localities. **Natal:** Durban; Kaffraria; Upper Natal.

Range. Natal.

CALAMELAPS UNICOLOR POLYLEPIS Bocage

- 1873b. *Calamelaps polylepis* Bocage, Journ. Sci. Lisboa, 4, p. 216: Dondo, Angola.
 1895a. Bocage, p. 126, pl. ix. fig. 2.
 1896d. Boulenger, p. 246.
 1897a. Bocage, p. 201 (misprinted *Galamelaps*).
 1901a. Tornier (part), p. 86.
 1904. Ferreira, p. 116.
 1910a. Sternfeld, p. 32, fig. 36.
 1913e. Hewitt, p. 480.
 1915a. Boulenger (part), p. 214.
 1915c. Boulenger (part), p. 632.

¹ Said to be 13 in type, considered erroneous by FitzSimons (1937a).

² Said to be 134 in type, recounted as 140 by FitzSimons (1937a).

1925. Werner (part), 1924, p. 151.
 1937b. Monard, p. 129.
 1888b. *Calamelaps miolepis* Günther, Ann. Mag. Nat. Hist. (6), 1, p. 323:
 Cape MacLear, Lake Nyasa, Nyasaland.
 1891a. Boulenger, p. 307.
 1896a. Bocage, p. 103.
 1909b. *Calamelaps concolor* Chubb (not Smith), p. 34.
 1939b. *Calamelaps unicolor* FitzSimons, V. (not Reinhardt), p. 24.

Names. Angolan Purple-glossed Snake (English).

Description. Differs from *C. u. warreni* only in its more numerous midbody scale-rows which are 21, smooth; ventrals 163–212; anal divided; subcaudals 16–27.

Color: As in *C. u. warreni*.

Size. Total length of supposed ♂, 480 (430 + 50) mm. from Angola (Bocage); total length of supposed ♀, 535 (504 + 31) from Birchenough Bridge surpassed by another of 690 (... + ...) mm. from Empandeni, Southern Rhodesia (Hewitt).

Sexual dimorphism. None of the ten specimens recorded in the literature have been sexed, but they would appear to fall into two groups, viz. supposed ♂♂ with ventrals 163–194, subcaudals 27, and supposed ♀♀ with ventrals 200–212, subcaudals 16–20.

Habitat. A burrowing snake, easily mistaken for the burrowing viper (*Atractaspis congica*) which sometimes occurs in the same localities.

Localities. **Angola:** Cazengo; Dondo; Humbe; Quissangues. **Transvaal:** Hectorspruit (but scale-count not given); near Nylstroom; Palmaryville. **Southern Rhodesia:** Birchenough Bridge; Empandeni. **Nyasaland:** Cape MacLear, i.e. Livingstonia. **Tanganyika Territory:** Tukuyu (Langenburg) at northwest end of Lake Nyasa.

Range. Angola and (?) Transvaal north to extreme southwestern Tanganyika Territory.

CALAMELAPS UNICOLOR WARRENI Boulenger

- 1896a. *Calamelaps unicolor* Bocage (not Reinhardt), p. 94.
 1901a. Tornier (part), p. 86.
 1933h. Loveridge (part), p. 260.
 1936j. Loveridge (part), p. 267.
 1937. Pitman (part), p. 326.
 1938a. Pitman (part), p. 217.
 1938b. Pitman (part), pp. 40, 179, 315 (reprint).

- ?1908c. *Calamelaps polylepis* Sternfeld (not Bocage), p. 247.
 1915a. Boulenger (part), p. 214.
 1915c. Boulenger (part), p. 632.
 ?1921a. Angel, p. 42.
 1923e. Loveridge, p. 889.
 1925. Werner (part), 1924, p. 151.
 ?1934. Pitman, p. 298.
 1908b. *Calamelaps warreni* Boulenger, Ann. Natal Mus., 1, pp. 230, 234, fig. 3: Kosi Bay, Zululand.
 1910b. Boulenger, p. 516.
 1912. FitzSimons, F. W., pp. 127, 128.
 1912. Hewitt, p. 276.
 1913e. Hewitt, p. 480.
 1925. Werner, 1924, p. 151.
 1928. Cott, p. 953.
 1935. Cott, p. 970.
 1915a. *Calamelaps mellandi* Boulenger, Proc. Zool. Soc. London, p. 214: Chirini Island, Lake Bangweulu, Northern Rhodesia.
 1925. Werner, 1924, p. 151.
 1934. Pitman, p. 298.
 1942e. *Calamelaps unicolor warreni* Loveridge, p. 295.

Names. Eastern Purple-glossed Snake (English); *ngogoma* (Pokomo); *mbitu* (Makonde, but not specific); *nyeresi* (Nyakusa).

Description. Rostral once and three quarters to twice as broad as deep, the triangular portion visible from above as long as, or nearly as long as, its distance from the frontal; nostril in a semidivided or divided, rarely entire,¹ nasal; internasals much broader than long, their median suture as long as, or longer than, that of the prefrontals; frontal once and a third to once and two thirds as long as broad (in the middle), longer than its distance from the end of the snout, much shorter than the parietals; supraocular small; no loreal; no preocular; eye small, its diameter less than half its distance from the mouth; postocular small, rarely absent² through fusion with the supraocular; temporal 1 only; upper labials 6, rarely 5, the third and fourth entering the orbit, third, rarely second and third² or only second³, in contact with the prefrontal, fifth, rarely fourth³, largest and in contact with the parietal; fourth lower labial largest; 4 lower labials in contact with the anterior sublinguals, which are much longer than the posterior which are often scarcely differentiated. Midbody scales in 19 rows, smooth; ventrals 161–203; anal divided; subcaudals 17–30.

¹ In type of *warreni*.

² In type of *warreni*.

³ In type of *mellandi*.

Color. Above and below uniformly iridescent black (fading to brown in alcoholic specimens exposed to sunlight) or opaque bluish gray when about to slough.

Size. Total length of ♂ (M.C.Z. 30399), 475 (430 + 45) mm. from Mwaya; total length of ♀ (M.C.Z. 48428), 670 (630 + 40) mm. from Mbanja.

Remarks. This form with 19 midbody scale-rows, being intermediate between *unicolor* and *polylepis* was at first united with one, and then the other, of these forms until Boulenger described *warreni* in 1908 on an individual which was not wholly typical. The characters on which he founded *C. mellandi*, viz. absence of postocular, second supralabial in contact with prefrontal and fourth with parietal, also occur spasmodically in the typical form, which, however, has 17 midbody scale-rows. I placed *mellandi* in the synonymy of *warreni* in 1942.

Sexual dimorphism. ♂♂ with ventrals 161–177, subcaudals 26–30, and ♀♀ with ventrals 179–209, subcaudals 17–22.

Habitat. A burrowing species, readily mistaken for one or other of the very venomous burrowing vipers (*Atractaspis*) occurring within its range. It has been found wandering above ground in the early morning after a night of rain.

Localities. **Zululand:** Kosi Bay. **Transvaal:** Southern Rhodesia: Empandeni. **Northern Rhodesia:** Chirini Id., Lake Bangweulu; Lealui; Sesheke. **Mozambique:** Caia; Chifumbazi; Lumbo. **Tanganyika Territory:** Amboni Estate near Tanga; Mbanja; Morogoro (? as found bottled in house); Mwaya; Nchingidi; Tanga. **Kenya Colony:** Ngatana, Tana River.

Range. Zululand and Southern Rhodesia (at Empandeni, where it meets with *polylepis*) north to Kenya Colony (at Ngatana.).

CALAMELAPS UNICOLOR UNICOLOR (Reinhardt)

- 1843. *Calamaria unicolor* Reinhardt, K. Danske Vidensk. Selsk. Afhandl. 10, p. 236, pl. i, figs. 1–3: Gunea, West Africa.
- 1862. *Amblyodipsas unicolor* Jan, p. 41.
- 1896. Tornier, p. 79.
- 1877c. *Atractaspis Hildebrandtii* Peters, Monatsb. Akad. Wiss. Berlin, p. 616, pl. –, fig. 3: Zanzibar coast.
- 1896d. Boulenger, p. 512.
- 1898. Boettger, p. 136.
- 1901a. Tornier, p. 85.
- 1912. Hobley, p. 56.

1913. Boettger, p. 353.
 1866a. *Calamelaps unicolor* Günther, p. 25.
 1893. Pfeffer, p. 77.
 1896d. Boulenger, p. 245.
 1897. Tornier, p. 65.
 1901a. Tornier (part), p. 85.
 1902a. Boulenger, p. 447.
 1908b. Sternfeld, pp. 219, 233.
 1909a. Sternfeld, p. 22.
 1910a. Sternfeld, p. 32.
 1911c. Boulenger, p. 166.
 1915c. Boulenger, p. 632.
 1919b. Boulenger, p. 291.
 1922. Aylmer, p. 15.
 1923. Schmidt, p. 116.
 1924b. Loveridge, p. 7.
 1925. Werner, 1924, p. 151.
 1928c. Barbour & Loveridge, p. 130.
 1933f. Angel, p. 170, figs. 64-64a.
 1933m. Witte, p. 95.
 1936j. Loveridge (part), p. 267.
 1937f. Loveridge, pp. 493, 496.
 1937. Pitman (part), p. 326, pl. xii, fig. 2; pl. M, fig. 2.
 1938a. Pitman (part), p. 217.
 1938b. Pitman (part), pp. 40, 179, 315 & pls. as above (reprint).
 1923. *Calamelaps niangarae* Schmidt, Bull. Am. Mus. Nat. Hist., 49, p. 117, fig. 12: Niangara, Belgian Congo.
 1928g. *Calamelaps concolor* Loveridge (not Smith), p. 41 (*lapsus* for *unicolor*.)

A further citation of "*unicolor*" will be found under *u. polylepis*.

Names. Equatorial Purple-glossed Snake (English).

Description. Rostral once and a half to nearly twice as broad as deep, the triangular portion visible from above as long as, or nearly as long as, its distance from the frontal; nostril in a semidivided or divided, rarely entire, nasal; internasals much broader than long, their median suture as long as, or shorter, or longer¹ than the length of that of the prefrontals; frontal once and a quarter to once and two thirds as long as broad (in the middle), as long as, or longer than, its distance from the end of the snout, much shorter than the parietals; supraocular small; no loreal; no preocular; eye small, its diameter only half its distance from the mouth; postocular small, rarely absent

¹ In types of *hildebrandtii* and *niangarae*.

through fusion with the supraocular; temporal 1 only; upper labials 6, rarely 5¹, the third and fourth, rarely second and third, entering the orbit, third, rarely second, in contact with the prefrontal, fifth, rarely fourth, largest and in contact with the parietal; fourth lower labial largest; 4 lower labials in contact with the anterior sublinguals, which are much longer than the posterior, which are often scarcely differentiated. Midbody scales in 17 rows, smooth; ventrals 164–208: anal divided; subcaudals 21–38.

Color. Above and below uniformly iridescent black (fading to brown in alcoholic specimens exposed to sunlight) or opaque bluish gray when about to slough.

Size. Total length of ♂ (type of *niangarae*), 414 (366 + 48) mm. from Niangarae; total length of ♀ (A.M.N.H.), 722 (672 + 50) mm. from Faradje.

Remarks. Tornier (1901a) was the first to synonymize *Atractaspis hildebrandtii* with *unicolor*. Accorinti's (1913, p. 300) record of it from Eritrea, however, obviously refers to a true viper and not to a *Calamclaps*. In 1925 Werner (1924, p. 151) synonymized *niangarae*, a species which was thought to differ from *unicolor* because the median suture of its internasals was longer (instead of as long as, or shorter) than that between the prefrontals. In this, however, it agreed with *hildebrandtii*. Its other supposed differences were chiefly those of sex, and it is interesting to note that Boulenger (1896d) had recorded a Sierra Leone specimen with exactly the same ventral and subcaudal counts as had the type of *niangarae*. Witte (1933m) has since obtained *unicolor* at Niangara.

As a result of Tornier's remarks and records, Barbour and Loveridge (1928c) added *polylepis* to the synonymy of *unicolor*, but now, with additional material, and after a study of all the literature, the true position begins to emerge of forms occupying definite geographical areas, though a good deal of overlapping occurs where the western and eastern forms meet.

Sexual dimorphism. ♂♂ with 164–182 ventrals, 28–38 subcaudals, and ♀♀ with 201–208 ventrals, 17–21 subcaudals.

Diet. A wolf snake (*Lycophidion c. acutirostre*) was disgorged by an Equatorial Purple-glossed Snake shortly after capture, the prey being only 20 mm. shorter than the predator. The similarity in the parallel development of these two blackish, burrowing snakes was striking, the prey having nine ventrals fewer, and four subcaudals more, than its

¹ These rare labial variations in a snake from Mt. Mbololo.

vanquisher at Changanwe. A skink (*Lygosoma kilimensis*) in a Nyange snake, a snake (*Aparallactus werneri*) and a caecilian (*Boulengerula boulengeri*) in Amani specimens.

Defence. The fact that Peters, overlooking the absence of poison fangs, described this snake as a viper, and was followed by Boulenger, Boettger and others who identified fresh material with *hildebrandtii*, is sufficient and eloquent proof of the close superficial resemblance between the two genera, making it essential when capturing *Calamelaps* to treat them as if they were indeed dangerous vipers.

Habitat. A burrowing species of which several were taken in clearing land at Amani, while another was hoed up in a native garden at Nyange. This race seems to be chiefly associated with forested, or recently deforested, areas at altitudes below 3,000 feet.

Localities. Bocage's (1896a) and Sternfeld's (1908c) records for Mozambique have been arbitrarily transferred to *C. u. warreni* as other Mozambique material, whose scales could be counted, were referable to that race.

Tanganyika Territory: Amani, Usambara Mtns.; Bagamoyo (Pfeffer, requires checking); Nyange, Uluguru Mtns.; Tanga. **Kenya Colony:** Changanwe; Mombasa; Mount Mbololo; Peccatoni. **Uganda:** Bussu; Kampala. **Belgian Congo:** Faradje; Niangara. **Nigeria: Togo. Gold Coast. Sierra Leone. Guinea.**

Range. Tanganyika Territory (Uluguru Mountains) north to Kenya Colony (at Peccatoni, *fide* Boettger) west to Sierra Leone and "Guinea."

CALAMELAPS UNICOLOR FEAE Boulenger

- 1906i. *Calamelaps feae* Boulenger, Ann. Mus. Civ. Stor. Nat. Genova, (3), 2, p. 214, fig. 9: Rio Cassine, Portuguese Guinea.
- 1919b. Boulenger, p. 291.
- 1925. Werner, 1924, p. 151.
- 1933f. Angel, p. 171.

Names. Western Purple-glossed Snake (English).

Description. Rostral once and a half as broad as deep, the triangular portion visible from above as long as its distance from the frontal; nostril in a divided nasal; internasals much broader than long, their median suture longer than that of the prefrontals; frontal once and a third as long as broad (in the middle), longer than its distance from the end of the snout, much shorter than the parietals; supraocular small; no loreal; no preocular; eye small, its diameter only half its distance

from the mouth; postocular small; temporal 1 only; upper labials 5, the second and third entering the orbit, second in contact with the prefrontal and posterior nasal, fourth largest and in contact with the parietal; fourth lower labial largest; 4 lower labials in contact with the anterior sublinguals, which are much longer than the posterior which may be scarcely differentiated. Midbody scales in 15 rows, smooth; ventrals 196; anal divided; subcaudals 23.

Color. Above and below uniformly iridescent black (fading to brown in alcoholic specimens exposed to sunlight).

Size. Total length of *alleged* ♂, 610 (560 + 50) mm. Type.

Remarks. Known only from the type, said to be a male. The above description is based on the original and on the figures.

Localities. **Portuguese Guinea:** Rio Cassine.

Range. Portuguese Guinea.

Genus MIODON

- 1858. *Microsoma* Jan (not Mocquart), Revue Mag. Zool. (2), **10**, p. 519 (type *neuwiedii* Jan).
- 1859. *Miodon* A. Duméril, Arch. Mus. Hist. Nat. Paris, **10**, p. 206 (type *Elapomorphus gabonensis* A. Duméril).
- 1860. *Urobelus* Reinhardt, Vidensk. Meddel. Kjobenhavn, p. 229 (type *acanthias* Reinhardt).
- 1902a. *Cynodontophis* Werner, Verh. Zool.-Bot. Ges. Wien, **52**, p. 346 (type *aemulans* Werner = *notatus* Peters).

Maxillary very short with 2-4 teeth followed after an interspace by 1-2 large grooved fangs situated in advance of the eye; second and third, or third and fourth, mandibular teeth enlarged, fang-like. Head small, not distinct from neck; eye very small, with round pupil; nasal entire or divided, not in contact with the rostral, the internasal forming a suture with the first labial; no loreal; 1 preocular. Body cylindrical; scales smooth, without pits, in 15 rows; ventrals rounded. Tail very short; subcaudals in two rows.

Range. Africa in forested areas of equatorial belt from Liberia east to Uganda and western Tanganyika Territory.

Remarks. *Microsoma* of Jan is antedated by that of Mocquart, 1854 (Ann. Soc. Ent. France (3), **2**, p. 737) proposed for a genus of Diptera. *Cynodontophis* was originally believed to differ from *Miodon* in dentition. Bogert (1940, p. 46) has shown, however, that such differences were due to fang replacement; his remarks on the subject should be consulted. This author also describes the hemipeneal structure.

Key to the Species

1. Anal entire; dorsum with pattern of 5 parallel black lines; ventrals 183–216; subcaudals 16–22; range Sierra Leone to Togoland (or Nigeria, *fide* Angel).....*g. acanthias*
(p. 170).....2
- Anal divided¹.....3
2. Dorsum with pattern of 3 parallel black lines; ventrals 219–246; subcaudals 11–21; range Gold Coast to Dahomey (with type allegedly from Gabon, *i.e.* French Congo).....*g. gabonensis*
(p. 172).....3
- Dorsum without pattern of parallel black lines.....3
3. Dorsum with pattern of 2 parallel series of black spots; ventrals 178–228; subcaudals 14–19; range French Cameroon south to French Congo.....*g. notatus*
(p. 173).....4
- Dorsum uniformly dark.....4
4. Nape and crown pale fawn with dark mottlings; throat white; ventrals 181–252; subcaudals 15–25; range (Togo¹ *fide* Werner) southeastern Nigeria south to Angola east to Uganda (west of Ruwenzori).*g. collaris*
(p. 175).....5
- Nape and crown of head entirely black, or with a sharply distinct broad white band across the parietal region.....5
5. Top of head iridescent black like nape and dorsum; throat white or black; ventrals 202–241; subcaudals 15–21; range western Congo (Poko) east to central Uganda (Mabira Forest) and western Tanganyika..*g. christyi*
(p. 178).....5
- Top of head from snout to behind eyes, black, posterior half of head and nape pure white; ventrals 237–258; subcaudals 13–18; range western Congo (Idjwi Island, Lake Kivu) to central Uganda (Entebbe).*g. graueri*
(p. 180).....5

MIODON ACANTHIAS (Reinhardt)

1860. *Urobelus acanthias* Reinhardt, Vidensk. Meddel. Kjobenhavn, p. 229
pl. iii: Guinea.
- 1893c. Matschie, p. 213.
1863. *Elapomorphus acanthias* Jan, p. 47.
1863. Jan, p. 39.
1865. Jan, livr. 14, pl. iii, fig. 4.
- 1888b. Günther (part), p. 323.

¹ Allegedly entire in a Congo specimen of *M. g. collaris*, *fide* Bocage (1895a, p. 126)

- 1896d. *Miodon acanthias* Boulenger, p. 250.
1908b. Sternfeld, pp. 219, 233.
1909a. Sternfeld, p. 22.
1915a. Boulenger, p. 215.
1919b. Boulenger, p. 291.
1922. Aylmer, pp. 15, 22.
1925. Werner, 1924, p. 152, fig. 13.
1930a. Barbour & Loveridge, p. 773.
1933f. Angel, p. 173.
1941e. Loveridge, p. 123.

Name. Five-striped Snake-eater (English).

Description. Rostral broader than deep, just visible from above; nostril in a divided or entire nasal, separated from rostral; internasals as broad as long, two-thirds to three-quarters the length of the pre-frontals; frontal as long as, or once and two-thirds as long as, broad, as long as, or longer or shorter than, its distance from the rostral, much shorter than the parietals, once and a half to twice as broad as a supraocular; no loreal; preocular 1; eye small, its diameter half to two-thirds its distance from the mouth; postoculars 1-2; temporals 1 + 1; upper labials 7, the third and fourth entering the orbit; 4 lower labials in contact with the anterior sublinguals, which are longer than the posterior. Midbody scales in 15 rows, smooth; ventrals 183-216; anal entire; subcaudals 16-22 pairs.

Based on original descriptions, the literature, 8 Liberian specimens in the M.C.Z. and 1 in the U.S.N.M.

Color. Above, head more or less black, snout, upper lip, and an occipital bar white (reddish in life); a black nuchal band; dorsum pale reddish (Brazil red in life) with five longitudinal black stripes on body, three on tail, tip of tail white (reddish in life). Below, white (Bittersweet orange in life). The colors in life are from Ridgway and were based on a Liberian snake as noted by G. M. Allen.

Size. Total length of ♂ (M.C.Z. 22525), 514 (475 + 39) mm. from Nickabo; total length of ♀ (M.C.Z. 22524), 585 (555 + 30) mm. from Gbanga.

Sexual dimorphism. Assuming the two types to have been females, then ♂♂ have 183-195 ventrals, and 22 subcaudals, and ♀♀ have 207-212 ventrals, and 16-18 subcaudals, this being based on five males and five females.

Breeding. Between April 10-16, at Gibi, a ♀ held 4 eggs, each measuring *circa* 22 x 7 mm.

Localities. **Liberia:** Du River; Gbanga; Gibi Si Mountain;

Nickabo; Paiata. **Gold Coast:** Ashanti. **Togoland:** Misahöhe. **Nigeria** (*vide* Angel).

Range. Sierra Leone east to Nigeria.

MIODON GABONENSIS GABONENSIS (Duméril)

- 1856c. *Elapomorphus gabonensis* A. Duméril, Revue Mag. Zool. (2), 8, p. 468: Gaboon.
- 1859. Duméril, A., p. 206, pl. xvi, fig. 2.
- 1884b. Sauvage, p. 201.
- 1858. *Microsoma neuwiedi* Jan, Revue Mag. Zool. (2), 10, p. 519: Christiansborg, Gold Coast.
- 1859. Jan, pl. iv.
- 1866. *Elapomorphus (Urobelus) neuwiedi* Jan, livr. 15, pl. i, fig. 2.
- 1884a. *Miodon gabonense* Rochebrune, p. 153, pl. xvii, fig. 1: (the figure is of *gabonensis* but text is ignored).
- 1909a. Sternfeld, p. 22.
- 1896d. *Miodon neuwiedii* Boulenger, p. 253.
- 1908b. Sternfeld, pp. 219, 234.
- 1909a. Sternfeld, p. 22.
- 1917. Chabanaud, p. 377.
- 1917b. Chabanaud, p. 12.
- 1925. Werner, 1924, p. 153.
- 1933f. Angel, p. 173, figs. 65-65a.

Further citations of '*gabonensis*' will be found under *g. collaris* and *g. christyi*.

Name. Three-striped Snake-eater (English).

Description. Rostral slightly broader than deep, just visible from above; nostril in an entire nasal; internasals as broad as long, slightly shorter than the prefrontals; frontal as long as, or longer than, broad, as long as its distance from the rostral, much shorter than the parietals, nearly twice as broad as a supraocular; no loreal; preocular 1; eye small, its diameter two-thirds its distance from the mouth; postoculars 1-2; temporals 1 + 1; upper labials 7, the third and fourth entering the orbit; 3 or 4 lower labials in contact with the anterior sublinguals, which are slightly shorter than the posterior. Midbody scales in 15 rows, smooth; ventrals 219-246 (*vide* Angel); anal divided; subcaudals 11-21 pairs.

Based on original descriptions and figures; no material seen.

Color. Above, head black; back pale brown with three longitudinal black stripes; tail black. Below, white.

Size. Total length of type 550 (510 + 40) mm. allegedly from Gaboon, and (type of *neuwiedii*), 172 (162 + 10) mm. from Christiansborg.

Remarks. Both Duméril and Jan have figured their reptiles showing that both have three prominent black stripes running the entire length of the dorsum. With the exception of Sternfeld and Chabanaud, no one appears to have received true *gabonensis*, by which I mean a striped snake.

Boulenger, when writing the Catalogue of Snakes (1896d), referred to *gabonensis* material which I consider identical with *collaris*, for he had no representatives of either true (striped) *gabonensis* or *neuwiedii*, though recognizing the latter by trivial characters which are demonstrably variable in any large series of *collaris*.

I am uncertain if it is wise to treat *collaris* as a race of *gabonensis* for the ranges appear to overlap, this would be especially the case if the type of the latter actually came from the Gaboon. On the other hand to treat as full species snakes which differ only in color and pattern, would seem retrogressive.

Localities. **Gold Coast:** Christiansborg. **Togo:** Klein Popo. **Dahomey:** Agouagou. **French Congo** as Gaboon.

Range. Gold Coast east to Dahomey (and ? French Congo).

MIODON GABONENSIS NOTATUS (Peters)

- 1882d. *Microsoma notatum* Peters, Sitz. Ges. Naturf. Freunde Berlin, p. 127:
No locality.
- 1887b. Mocquard, p. 64.
- 1896d. *Miodon notatus* Boulenger, p. 252.
1897. Sjöstedt, p. 35.
1898. Werner, p. 212.
- 1908a. Sternfeld, pp. 414, 429.
- 1909b. Sternfeld, p. 22.
1910. Müller, p. 609.
- 1915a. Boulenger, p. 215.
- 1919b. Boulenger, p. 292.
1925. Werner, 1924, p. 153.
1940. Bogert, p. 46.
- 1902a. *Cynodontophis aemulans* Werner, Verh. Zool.-Bot. Ges. Wien, 52, p. 346: Congo.
1910. Müller, p. 610.
- 1915a. Boulenger, p. 215.
1923. Schmidt, p. 120.
1925. Werner, 1924, p. 153.

Further citation of '*notatus*' will be found under *g. collaris*.

Name. Spotted Snake-eater (English).

Description. Rostral broader than deep, just visible from above; nostril in a divided nasal, separated from¹, or in contact with², the rostral; internasals longer than broad, as long as, or two-thirds as long as, the prefrontals; frontal longer than broad, as long as its distance from the rostral, much shorter than the parietals, twice as broad as a supraocular; no loreal; preocular 1; eye small, its diameter half to two-thirds its distance from the mouth; postoculars 1-2; temporals 1 + 1; upper labials 7, the third and fourth entering the orbit; 3 lower labials in contact with the anterior sublinguals, which are as long as, or longer than, the posterior. Midbody scales in 15 rows, smooth; ventrals 178-228; anal divided; subcaudals 14-19 pairs.

Based on original descriptions, the literature, and one specimen.

Color. Above, head and nuchal collar black; back light brown with a double series of black spots which may be light-edged; tail black. Below, white (yellow in life?).

Size. Total length, 317 (288 + 29) mm. from Brazzaville.

Remarks. Andersson (1901) advocated the uniting of *notatus* with *gabonensis* but lacked material of both. Sternfeld (1908a), with *notatus* material, objected, though the characters with which he supported this view have since proved to be variable.

Müller (1910) referred *aemulans* to the synonymy of *notatus* but proposed to retain the genus *Cynodontophis*. Boulenger (1915a) retained both species and genera, separating *Cynodontophis* on the nasal being in contact with the rostral — which is not the case with our Cameroon specimen (M.C.Z. 14995) and is variable in the M.C.Z. series of *gabonensis collaris*.

Schmidt (1923) and Werner (1925) agree with the synonymizing of the species, but suggest that the genus should be retained. Bogert (1940), after a thorough study of the dentition in *g. collaris*, found that the alleged differences between *Miodon* and *Cynodontophis* were due to fang replacement and that *Cynodontophis* could not be retained.

Witte (1933m) referred six specimens from Kunungu, Belgian Congo, to *notatus* one of which is now M.C.Z. 42957. It is a typical *g. collaris* in coloration and it may be safely assumed that the others are the same for he recorded both *gabonensis* and *collaris* from Kunungu in the same paper.

Sexual dimorphism. None of the material mentioned in the literature is sexed, a Cameroon ♀ in the M.C.Z. has 201 ventrals and 14 subcaudals. Males probably have a range from 17-19.

¹ In type of *notatus*.

² In type of *aemulans*.

Localities. **French Cameroon:** Barombi; Bipindi; Dibongo near Edea; Kribi; Sakbayeme. **French Congo:** Brazzaville; Cap Lopez. (Recorded from **Belgian Congo:** Kunungu by Witte (1933m) in error).

Range. French Cameroon and adjacent French Congo.

MIODON GABONENSIS COLLARIS (Peters)

- 1862. *Elapomorphus gabonicus* Jan (not Duméril), p. 47.
- 1866. Jan, livr. 15, pl. i, fig. 1.
- 1865a. *Polemon barthii* Günther (not Jan), p. 90.
- 1881d. *Microsoma collare* Peters, Sitz. Ges. Naturf. Freunde Berlin, p. 148; Macange, Cuango = Kwango, French Equatorial Africa.
- 1887a. Bocage, p. 182.
- 1895a. Bocage, p. 124, pl. xiv, figs. 1-2.
- 1895c. Bocage, p. 13.
- 1903a. Bocage, p. 44.
- 1887b. *Urobelus gabonicus* Boulenger, p. 127.
- 1887b. *Microsoma fulvicollis* Mocquard, Bull. Soc. Philom. Paris (7), **11**, p. 65: Franceville, French Congo.
- 1888b. *Elapomorphus acanthias* Günther (not Reinhardt), p. 323.
- 1888b. *Elapomorphus cautiens* Günther, Ann. Mag. Nat. Hist. (6), **1**, p. 323, pl. xix, fig. B: Cameroon Mountains, British Cameroons.
- 1896d. *Miodon collaris* Boulenger, p. 251.
- 1897b. Mocquard, p. 13.
- 1900b. Boulenger, p. 454.
- 1903. Gough, p. 468.
- 1905c. Boulenger, p. 114.
- 1905. Ferreira, p. 169.
- 1908a. Sternfeld, p. 413.
- 1911. Lampe, p. 202.
- 1915a. Boulenger, p. 215.
- 1919b. Boulenger, p. 291.
- 1923. Schmidt, p. 120.
- 1933m. Witte, p. 95.
- 1937b. Monard, p. 129.
- 1896d. *Miodon gabonensis* Boulenger (part: no material), p. 252.
- 1897. Sjöstedt, p. 35.
- 1897b. Werner, p. 400.
- 1898a. Werner, p. 211.
- 1899a. Werner, p. 140.
- 1900b. Boulenger, p. 454.
- 1901. Andersson, p. 23.
- 1908a. Sternfeld, pp. 413, 428.

- 1909b. Sternfeld, p. 22.
 1910. Müller, p. 609.
 1911. Lampe, p. 202.
 1915a. Boulenger, p. 215.
 1915c. Boulenger, p. 633.
 1917. Sternfeld, p. 480.
 1919b. Boulenger, p. 291.
 1919g. Boulenger, p. 26.
 1923. Schmidt, p. 118.
 1925. Werner, 1924, p. 153.
 1932b. Witte, p. 14.
 1933f. Angel, p. 175.
 1933. Schouteden, p. 236.
 1933m. Witte, p. 95.
 1940. Bogert, p. 45.
 1908b. *Miodon gabonensis* var. *collaris* Sternfeld, pp. 219, 234.
 1910. *Cynodontophis werneri* Müller, Abh. Bayer Akad. Wiss., 2 Kl., 24, p. 612: Cameroons?
 1933m. *Miodon notatus* Witte (not Peters), p. 95.
 1942e. *Miodon gabonensis collaris* Loveridge, p. 298.

Name. Pale-collared Snake-eater (English).

Description. Rostral broader than deep, just visible from above; nostril in a semidivided, divided, or entire nasal; internasals as broad as long, as long as, or almost as long as, the prefrontals; internasal and prefrontal in contact with, or separated from the labials; frontal longer than broad, as long as, or shorter than, its distance from the rostral, much shorter than the parietals, once and a half to twice as broad as a supraocular; no loreal; preocular 1; eye small, its diameter half¹ to three-quarters its distance from the mouth; postoculars 2, rarely 1; temporals 1 + 1; upper labials 7, the third and fourth entering the orbit; 4, very rarely 3, lower labials in contact with the anterior sublinguals, which are as long as, or longer than, the posterior. Mid-body scales in 15 rows, smooth; ventrals 181-252; anal divided²; subcaudals 15-25 pairs.

Based on original descriptions, all data in literature, and much material in A.M.N.H., C.N.H.M. and M.C.Z.

Anatomy. For discussion on dentition and description of hemipenes, see Bogert (1940).

Color. Above, head and nape pale brown or fulvous with some black blotches on the snout or crown and below the eye; back bluish black or slaty gray, the scales edged with darker; tip of tail white.

¹ A third to equal according to some authors.

² Entire in one Congo snake according to Bocage (1895a, p. 126).

Below, white, except for some dusky markings on the chin and the dorsal color impinging on the outer (lateral) edges of the ventrals, or throat white and rest of under surface black (in an Angolan specimen. M.C.Z. 32593).

Size. Total length of ♂ (A.M.N.H. 12452), 535 (501 + 34) mm. from Medje; total length of ♀ (M.C.Z. 13606), 661 (630 + 31) mm. from Niapu, but exceeded by an unsexed specimen, though almost certainly a ♀, recorded as 860 (818 + 42) mm. by Sternfeld, which is probably the Togo snake of 850 (808 + 42) mm. of Werner (1897b).

Remarks. As indicated under *M. g. gabonensis*, I am of the opinion that it may prove possible to separate two forms which have long been confused, and that the overlap in ranges between the striped *gabonensis* and the pale-collared *collaris* may not prove to be so great as has been supposed.

Boulenger (1896d) synonymized *fulvicollis* and *cacutiens* with the composite which he called *gabonensis*. Bogert (1940) would add both *collaris* and *weneri* but he had in mind the composite rather than the striped snake of Duméril, for apart from this his remarks form the most important contribution to our understanding of the genus in recent times.

Sexual dimorphism. Using the sexed (but unchecked) records in the literature, ♂♂ have 200–232 ventrals, and 19–25 subcaudals, while ♀♀ have 195–252 ventrals, and 16–19 subcaudals, this being based on five males and twelve females; 19 subcaudals is correct for both sexes, being found in M.C.Z. material.

Diet. A snake, 180 mm. in length but with head digested, in a 230 mm. *collaris* from the Congo (Schmidt).

Parasites. Two large linguatulids in lungs of a Metet snake (Bogert).

Habitat. Apparently associated with virgin forest.

Localities. **Togo** (based on a single specimen collected by Butner, recorded by Werner (1897b) and repeated by Sternfeld (1908a–b), it may well be regarded as doubtful pending confirmation by fresh material from Togo). **Nigeria:** Old Calabar. **British Cameroon:** Bibundi; Cameroon Mountains; Cape Debundscha; Isongo; Mapanja; Rio del Ray; Victoria. **French Cameroon:** Bipindi; Bitye; Dibongo near Edea; Kribi; Lekung River; Lolodorf; Longji; Metet. **Fernando Po:** **Spanish Guinea:** Esong (or Eosung) near Bakossiberge. **French Congo:** Franceville; Lambarene. **Angola:** Cazengo; Golungo Alto; Missao de Donda; Pungo Adungo; Quindumbo. **French Equatorial Africa:** Macange, Kwango. **Belgain Congo:** Duma; Goma (Ngoma);

Kunungu; Medje; Moanda; Mocra; Niangara; Niapu; Nyampoko; Panga, Aruwimi River; Sandoa; Stanleyville. **Uganda:** Bundibugyo, northwest of Ruwenzori Mountains.

Range. Togo?, certainly southeastern Nigeria, south to Angola and east to Uganda (northwest of Ruwenzori Mountains).

MIODON GABONENSIS CHRISTYI Boulenger

- 1903f. *Miodon Christyi* Boulenger, Ann. Mag. Nat. Hist. (7), **12**, p. 354: Uganda.
- 1910a. Sternfeld, p. 34 (as *Christyi*).
- 1911c. Boulenger, p. 166.
- 1915c. Boulenger, p. 633.
- 1924b. Loveridge, p. 7.
1925. Werner, 1924, p. 153.
- 1937f. Loveridge, p. 502.
1937. Pitman, p. 332, pl. xii, fig. 3, col. pl. M, fig. 3.
- 1938a. Pitman, pp. 217, 233.
- 1938b. Pitman, pp. 40, 185, 187, 188, 315, 331 and plates as above (reprint).
- 1910a. *Miodon gabonensis* Sternfeld (not Duméril), p. 34.
- 1924b. Loveridge, p. 7.
- 1933h. Loveridge, p. 261.
- 1936h. Loveridge, p. 40.
- 1937f. Loveridge, p. 502.
- 1938a. Pitman, p. 217.
- 1938b. Pitman, pp. 186, 187, 315 (reprint).
1923. *Miodon unicolor* Schmidt, Bull. Am. Mus. Nat. Hist., **49**, p. 119, fig. 13: Poko, Belgian Congo.
1925. Werner, 1924, p. 153.

Name. Eastern Snake-eater (English).

Description. Rostral broader than deep, just visible from above; nostril in a divided¹ or entire² nasal; internasals longer than broad, shorter than the prefrontals; frontal slightly longer than broad, as long as¹, or shorter than², its distance from the rostral, much shorter than the parietals, broader than a supraocular; no loreal; preocular 1; eye small, its diameter half to three-fifths its distance from the mouth; postoculars 2; temporals 1 + 1, rarely 1 only²; upper labials 7, the third and fourth entering the orbit, rarely the fifth³ or the seventh² in contact with the parietals; 4 lower labials in contact with the anterior

¹ In type of *unicolor* from Poko.

² In type of *christyi* from Uganda.

³ In specimen from Mambawanga Hill.

sublinguals, which are longer than the posterior. Midbody scales in 15 rows, smooth; ventrals 202-241; anal divided; subcaudals 15-24 pairs.

Based on original descriptions and figures, data in literature cited, and three specimens from Congo, Uganda and Tanganyika.

Color. Above, black with an iridescent bluish bloom. Below, uniform with dorsum or throat only black or white; ventrals and subcaudals dull creamy- or dirty white broadly margined with black laterally, or mainly black with their posterior edges mottled with white.

Size. Total length of ♂, 661 (617 + 44) mm. from Mambawanga Hill; total length of type of *christyi*, allegedly a ♀, 430 (402 + 28) mm.

Remarks. In the extreme eastern part of its range, *M. g. collaris* shows a marked tendency to melanism, several males being uniformly black like a *Calamelaps* while other specimens have the black ventrals mottled with white on the posterior edges (as in *unicolor*) or have retained the light ventrals but more or less broadly edged with black (as in *christyi*). All, however, would appear to have the head, nape and dorsum uniformly colored so I have utilized this rather slender distinction to retain the name *christyi* for these eastern snakes. Perhaps additional material will show it to be untenable.

Sternfeld (1910a) had no material of *christyi*, all his descriptions being translations into German from Boulenger, a point that Pitman has not realized in retranslating back to English. While Sternfeld's text regarding *gabonensis* is taken from Boulenger, I regard his record of a specimen from Dar es Salaam with misgiving until it is verified, it is more probably a *Calamelaps*. If it is correct it extends the range 400 miles to the east and introduces into the coastal zone a species usually associated with forested areas.

Sexual dimorphism. Assuming that the type of *christyi* is a male, then ♂♂ have 202-217 ventrals, and 19-24 subcaudals, and ♀♀ have 221-241 ventrals, and 15-18 subcaudals, this being based on seven (four supposedly so) males and three females.

Diet. The tip of a blind snake's (*Typhlops* or *Leptotyphlops*) tail was present in the stomach of the Ilolo snake.

Habitat. Associated with forested or recently deforested land such as at Mbango, where Pitman's natives secured one while clearing thickets of "lantana" from an old rubber plantation. A burrowing species occurring at altitudes of 4000 (Mubango) to 4600 (Ilolo) feet.

Localities. **Belgian Congo:** Mambawanga Hill; Poko. **Uganda:** Budongo Forest; Bussu; Katebo, n.w. Lake Victoria; Kilembe, e. of Ruwenzori Mountains; Mubango, Mabira Forest. **Tanganyika**

Territory: Ilolo; ? Dar es Salaam (see comments regarding this record under the heading of Remarks).

Range. Belgian Congo (in extreme east) east to Uganda and Tanganyika Territory (in extreme west).

MIODON GABONENSIS GRAUERI Sternfeld

1908. *Miodon Graueri* Sternfeld, Sitz. Ges. Naturf. Freunde Berlin, p. 94:
Entetbe, *i.e.* Entebbe, Uganda.
1908c. Sternfeld, p. 244, fig.
1910a. Sternfeld, p. 35, fig. 40.
1915c. Boulenger, p. 633.
1924b. Loveridge, p. 7.
1925. Werner, 1924, p. 153.
1937. Pitman, p. 334, pl. xii, fig. 4; col. pl. M, fig. 4.
1938b. Pitman, pp. 40, 187, plates as above (reprint).
1942e. *Miodon gabonensis graueri* Loveridge, p. 298.

Name. Central Lake Region Snake-eater (English).

Description. Rostral nearly twice as broad as deep, just visible from above; nostril in a divided nasal; internasals as broad as long, as long as, or almost as long as, the prefrontals; frontal as long as, or longer than, broad, as long as, or shorter than, its distance from the rostral, much shorter than the parietals, once and a half to twice as broad as a supraocular; no loreal; preocular 1; eye small, its diameter half to two-thirds its distance from the mouth; postocular 2; temporals 1 + 1; upper labials 7, the third and fourth entering the orbit; 4 lower labials in contact with the anterior sublinguals, which are longer than the posterior. Midbody scales in 15 rows, smooth; ventrals 237–258; anal divided; subcaudals 13–18 pairs.

Based on data of type and examination of the three Idjwi snakes.

Color. Above, black with an iridescent bloom; a broad white band crosses head and nape, extending from the back of the frontal across the parietals and over three scale-rows on the nape. Below, and on lower half of outer scale-rows, white.

Size. Total length of ♂ (Mus. Congo), 325 (310 + 15) mm.; total length of ♀ (M.C.Z. 48432), 370 (358 + 12) mm.; both from Idjwi Island.

Remarks. The species is known only from the type, apparently a ♂; and three others (♂ ♀ ♀) which I collected on Idjwi Island in Lake Kivu, Belgian Congo. The latter is in the general region where Grauer did so much of his collecting and it seems strange that, if the

type was correctly labeled, no second example has been taken at Entebbe where so much collecting has been done by Johnston, Degen, Pitman and others.

Sexual dimorphism. Assuming the type to be a male, then ♂♂ have 237-238 ventrals, and 16-18 subcaudals, and ♀♀ have 254-258 ventrals, and 13 subcaudals, but only two of each sex are known.

Diet. Remains of a blind snake (*Typhlops b. lestradei*) and an egg, possibly a lizard's, were recovered from two Idjwi snakes.

Habitat. If the type locality is correct, then the fact that two of the Idjwi snakes were taken near the lake shore, may indicate a preference of this race for lakeside habitats. The Idjwi male, however, was taken while crossing a path in bush (recently deforested) country at an altitude of about 6000 feet.

Localities. **Belgian Congo:** Idjwi Island in Lake Kivu. **Uganda:** Entebbe.

Range. Western Belgian Congo east to central Uganda.

Genus APARALLACTUS

- 1849. *Aparallactus* A. Smith, Ill. Zool. S. Africa, **3**, App. p. 15 (type *capensis* Smith).
- 1849. *Elapomorphus* A. Smith (not Wiegmann), Ill. Zool. S. Africa, **3**, App. p. 16, footnote (type *capensis* Smith).
- 1854. *Uriechis* Peters, Monatsb. Akad. Wiss. Berlin, p. 623 (type *lunulatus* Peters).
- 1859a. *Elapops* Günther, Ann. Mag. Nat. Hist. (3), **4**, p. 161 (type *modestus* Günther).
- 1860. *Periaspis* Cope, Proc. Acad. Nat. Sci. Philadelphia, pp. 241, 266 (type *plumbeatra* Cope = *modestus* Günther).
- 1863a. *Cercocalamus* Günther, Ann. Mag. Nat. Hist. (3), **11**, p. 21 (type *collaris* Günther = *capensis* A. Smith).
- 1923b. *Guyomarchia* Angel, Bull. Mus. Hist. Nat. Paris, **29**, p. 348 (type *unicolor* Angel = *modestus* Günther).

Maxillary short with 5-10 small teeth followed *with or without* an interspace by 1-2 large *grooved or solid* fangs situated below the eye; anterior mandibular teeth longest. Head small, not distinct from neck; eye very small, with round pupil; nasal entire or divided; no loreal; 1, rarely 2, preoculars. Body cylindrical; scales smooth, without pits, in 15 rows; ventrals rounded. Tail moderate or short; subcaudals single.

Range. Africa south of 15° N., i.e. from Portuguese Guinea to Ethiopia.

Remarks. It would appear as if Sir A. Smith, realising that his *Elapomorphus* was preoccupied by that of Wiegmann in Fitzinger (1843 p. 25), sent his description of *Aparallactus* to be inserted by the printers. Whatever the circumstances, however, he published the description of *capensis* twice (p. 15 and p. 16) under different generic names.

The argument for merging *Elapops* with *Aparallactus* was presented by Bogert (1940, p. 43) whose studies of the dentition of *modestus* are responsible for range extensions incorporated in the above description.

Aparallactus hagemanni Gough was long ago removed from this genus by Boulenger (1919a) when he referred it to the synonymy of *Polemon bocourti* Mocquard.

Werner (1925), who was the last to publish a key to the species of this genus, listed 25, here reduced to 12!

In studying the genus it was interesting to note that a block of six western and northern species invariably have seven upper labials of which the third and fourth enter the orbit, while three eastern species (*wernerii*, *turneri* and *nigriceps*) have six labials with the second and third entering; three others (*c. bocagii*, *c. capensis* and *c. uluguruensis*) may present either arrangement though the first appears to be normal.

Synopsis of the Species of Aparallactus

1. A single prefrontal; range French Guinea east to Gold Coast... *lineatus*
(p. 183)
A pair of prefrontals.....2
2. First lower labial in contact with its fellow behind the mental.....3
First lower labial not in contact with its fellow behind the mental.....9
3. One or two upper labials in contact with a parietal.....4
Upper labials separated from parietal by temporals.....7
4. Usually two upper labials (fifth and sixth, rarely fifth only or sixth only)
in contact with a parietal; a single temporal (*very* rarely 1 + 1); range
Sierra Leone east to Uganda..... *modestus*
(p. 186)
A single upper labial (the fifth) in contact with a parietal; temporals
1 + 1.....5
5. Diameter of eye twice its distance from the mouth; range Togo east to
Nigeria..... *liddiardae*
(p. 191)
Diameter of eye less than twice its distance from the mouth.....6

6. Preocular usually not in contact with the nasal; range Anglo-Egyptian Sudan (Lado) east to Eritrea south to northern Tanganyika Territory (Arusha).....*concolor*
(p. 192)
- Preocular in contact with the nasal; range Belgian Congo (Dika) and Northern Rhodesia, east to Mozambique (Tete), south to Transvaal...
lunulatus
(p. 195)
7. Upper labials 7, the third and fourth entering the orbit; range dry uplands of southern Ethiopia (east of Lake Rudolf) to southeastern Tanganyika Territory (Rondo Plateau)*jacksonii*
(p. 197)
- Upper labials 6, the second and third entering the orbit.....8
8. Ventrals of ♂ and ♀ 141-161; range Tanganyika Territory (montane forests of Magrotto, Usambara and Uluguru).....*vernieri*
(p. 199)
- Ventrals of ♂ and ♀ 120-139; range Kenya Colony (dry coastal plain between Lamu and Malindi).....*turneri*
(p. 201)
9. Ventrals 168-191; range Angola and South West Africa east through ? southeastern Belgian Congo (Elisabethville) to western ? Mozambique (Chifumbazi) and Transvaal (Kruger Park).....*c. bocagii*
(p. 202)
- Ventrals 167 or less.....10
10. No light and black nuchal collar, uniformly iridescent plumbeous; size larger; range virgin forests of coastal Kenya Colony (Ngatana) and Tanganyika Territory (Magrotto, Usambara, Uluguru Mountains)....
c. uluguruensis
(p. 210)
- A black, light-edged nuchal collar; size smaller.....11
11. Ventrals 134-166; subcaudals 35-59; range savanna of Tanganyika Territory (Ujiji) east to southern Kenya Colony (Mt. Mbololo) south to Pondoland, and west to Angola (Quindumbo).....*c. capensis*
(p. 205)
- Ventrals 108-123; subcaudals 20-35; range Mozambique (Inhambane and Tete).....*nigriceps*
(p. 212)

APARALLACTUS LINEATUS (Peters)

- 1870c. *Uriechis (Metopophis) lineatus* Peters, Monatsb. Akad. Wiss. Berlin, p. 643, pl. i, figs. 3-3c: Keta, Guinea, i.e. Quittah, Gold Coast.
- 1885d. Müller, p. 678.

- 1893a. *Uricchis anomala* Boulenger, Ann. Mag. Nat. Hist. (6), **12**, p. 273:
Gold Coast. ♂.
- 1895h. *Aparallactus anomalus* Boulenger, p. 173.
- 1896d. Boulenger, p. 262, pl. xi, fig. 3.
- 1919b. Boulenger, p. 293.
- 1921a. Chabanaud, p. 471.
- 1921b. Chabanaud, p. 525.
1925. Werner, 1924, p. 158.
- 1933f. Angel, p. 179.
- 1895h. *Aparallactus lineatus* Boulenger, p. 173.
- 1896d. Boulenger, p. 261.
- 1919b. Boulenger, p. 293.
1925. Werner, 1924, p. 158.
- 1933f. Angel, p. 178.
- 1938d. Loveridge, p. 60.
- 1897a. *Aparallactus niger* Boulenger, Ann. Mag. Nat. Hist. (6), **19**, p. 154:
Sierra Leone. ♂.
- 1919b. Boulenger, p. 293.
- 1921a. Chabanaud, p. 471.
- 1921b. Chabanaud, p. 525.
1922. Aylmer, p. 15.
1925. Werner, 1924, p. 158.
- 1933f. Angel, p. 180.
- 1908a. *Elapops heterolepis* Mocquard, Bull. Mus. Hist. Nat., **14**, p. 261:
Assini, Ivory Coast. ♀.
1925. Werner, 1924, p. 158.
1917. *Rouleophis Chevalieri* Chabanaud, 1916, Bull. Mus. Hist. Nat., **22**, p.
379, figs. 22-23: Sampouyara, French Guinea.
- 1917b. Chabanaud, p. 12.
- 1921a. Chabanaud, p. 471.
- 1933f. Angel, p. 181, figs. 67-67a.

Description. Rostral nearly twice as broad as deep, the portion visible from above one third¹ to half² as long as its distance from the frontal; nostril in an entire or semidivided nasal; internasals as long as, or much shorter than, the *single* prefrontal; frontal once and a third to once and two thirds as long as broad (in the middle), as long as, or much longer than, its distance from the end of the snout, much shorter than the parietals, twice as broad as a supraocular; no loreal; preocular 1, in contact with the nasal; eye small, its diameter equal to, or slightly less or greater than, its distance from the mouth; postoculars 1² or 2¹, separated from the only temporal 1, flanking the

¹ In type of *niger*.

² In type of *chevalieri*.

outer border of the parietal without any enlarged shield below it posteriorly; upper labials 7, the third and fourth entering the orbit, sixth largest, fifth and sixth in contact with a parietal; first lower labial in contact with its fellow behind the mental; 4, rarely 5, lower labials in contact with the anterior sublinguals, which are as long as, or slightly longer than, the posterior. Midbody scales in 15 rows, smooth on females and young males, usually keeled on tail and posterior part of body in adult males; ventrals 151-170; anal entire; subcaudals 33¹-60.

Based on all original descriptions and literature, also a young striped ♂ (unquestionably *lineatus*) from "Guinea" (M.C.Z. 25826), and two adult plumbeous ♂♂ (undoubtedly *niger*) from Sanoquelle, Liberia (M.C.Z. 43206-7).

Color. Juvenile and Female. Above, olive, with three dark longitudinal lines, each scale of the outer series with a yellow spot. Below, pinkish white minutely speckled with gray.

Adult. Above, uniformly black. Below, and on lips, white, each ventral and subcaudal shield edged with black laterally and posteriorly and with a median black line, or tendency thereto, on tail.

Size. Total length of ♂ (type of *anomalus*), 440 (360 + 80) mm., and total length of ♀ (type of *lineatus*), 440 (383 + 57) mm.

The maximum length of 605 (407 + 198) mm. for *chevalieri* furnished by Chabanaud (1921a) appears to be erroneous, for Angel (1933f) in his redescription of the species, gives only 475 (375 + 100) mm. for an unsexed, but presumably a ♂, specimen.

Remarks. Boulenger (1919a) referred *Rouleophis chevalieri* to the synonymy of *niger*, an action with which Chabanaud (1921a) concurred. Angel (1933f), however, demurred on the grounds that the type of *niger* had 2 postoculars, while the six examples of *chevalieri* possess only 1, and for other reasons, which, after a study of the genus, I consider of even less importance. It is a fact that the type of *niger*, which is the most westerly specimen, remains unique in the possession of 2 postoculars; on the other hand, its nearest ally, *modestus*, displays 1 or 2 indiscriminately throughout its range though in a selected locality one or other condition may be fairly constant.

Angel (1933f) synonymized *Elapops heterolepis* with *anomalus*; later I (1938d) placed all four in the synonymy of *lineatus* for reasons stated there in considerable detail.

Sexual dimorphism. If one assumes the type of *anomalus* to have

¹ It seems possible that 33 and 35 were based on truncated tails, the next lowest subcaudal count is 41.

been a ♀, and not a ♂, then: ♂♂ have 151–164 ventrals, and 58–60 subcaudals, and ♀♀ have 161–170 ventrals, and 33¹ or 41–52 subcaudals.

Localities. **French Guinea:** Beyla; Sampouyara. **Sierra Leone.** **Liberia:** Sanoquelle (Sanikolé). **Ivory Coast:** Assini.² **Gold Coast:** Quittah (Keta).

Range. French Guinea east to Gold Coast.

APARALLACTUS MODESTUS (Günther)

- 1859a. • *Elapops modestus* Günther, Ann. Mag. Nat. Hist. (3), 4, p. 161, pl. iv, fig. C: West Africa.
 1860. Cope, p. 566.
 1865b. Günther, p. 152.
 1875a. Peters, p. 198.
 1884a. Rochebrune, p. 151 (ignored).
 1891b. Matschie, p. 614.
 1893c. Matschie, p. 213.
 1896d. Boulenger, pp. 262, 649.
 1897b. Mocquard, p. 8.
 1897. Sjöstedt, p. 35.
 1898. Boettger, p. 112.
 1898a. Werner, p. 210.
 1899a. Werner, p. 141.
 1900b. Boulenger, p. 454.
 1903. Gough, p. 468.
 1906i. Boulenger, p. 214.
 1908a. Sternfeld, pp. 414, 429.
 1909a. Sternfeld, p. 22, fig. 34.
 1909b. Sternfeld, p. 22, fig. 29.
 1910. Müller, p. 615.
 1911. Despaix, p. 240.
 1915a. Boulenger, p. 217.
 1919b. Boulenger, p. 293.
 1919g. Boulenger, p. 27.
 1922. Aylmer, pp. 15, 22.
 1923. Schmidt, p. 121, pl. xvii, fig. 2.
 1925. Werner, 1924, p. 158.
 1927d. Witte, p. 326.
 1933f. Angel, p. 183, figs. 68–68a.
 1933m. Witte, p. 96.
 1934a. Schwetz, p. 381.

¹ It seems possible that 33 and 35 were based on truncated tails, the next lowest subcaudal count is 41.

² Given as Assinie, presumably the town on the Ivory Coast side of the border.

- 1936h. Loveridge, p. 40.
 1937c. Loveridge, p. 278.
 1937. Pitman, p. 337, pl. xii, fig. 6, col. pl. N, figs. 1-2.
 1938a. Pitman, pp. 218, 233.
 1938b. Pitman, pp. 188, 190, 316, 331, plates as above (reprint).
 1860. *Periaspis plumbeatra* Cope, Proc. Acad. Nat. Sci. Philadelphia, p. 242: Liberia.
 1860. *Elapops plumbeater* Cope, p. 566.
 1862. *Elapops (Calamaria) Petersi* Jan, Arch. Zool. Anat. Fisiol., 2, p. 32: Gold Coast.
 1865. Jan, livr. 13, pl. iii, fig. 2.
 1885d. Müller, p. 678.
 1889. Mocquard, p. 145.
 1890b. Müller, p. 692.
 1893. Prato, p. 10.
 1896. *Aparallactus boulengeri* Werner, Verh. Zool.-Bot. Ges. Wien, 46, p. 363, pl. vi, figs. 6-6b: Cameroon.
 1897. Sjöstedt, p. 35 (as *boulengeri*).
 1897b. *Aparallactus peraffinis* Werner, Verh. Zool.-Bot. Ges. Wien, 47, p. 404, pl. ii, fig. 3: Interior of Cameroon.
 1897b. *Aparallactus ubangensis* Boulenger, Ann. Mag. Nat. Hist. (6), 19, p. 279, fig.: Zongo, Ubangi Rapids, Belgian Congo.
 1901g. Boulenger, p. 11, pl. iv, fig. 2.
 1903b. Bocage, p. 64.
 1915a. Boulenger, p. 217.
 1925. Werner, 1924, p. 151.
 1901g. *Aparallactus flavitorques* Boulenger, Ann. Musée Congo (1), 2, p. 11, pl. iv, fig. 3: Lubué, Kasai, Belgian Congo.
 1903b. Bocage, p. 64.
 1915a. Boulenger, p. 217.
 1925. Werner, 1924, p. 151.
 1927d. Witte, p. 325.
 1933m. Witte, p. 96.
 1938b. Pitman, pp. 40, 191.
 1902a. *Aparallactus dolloi* Werner, Verh. Zool.-Bot. Ges. Wien, 52, p. 346: Banzyville, Ubangi River, Belgian Congo.
 1915a. Boulenger, p. 216.
 1919b. Boulenger, p. 292.
 1925. Werner, 1924, p. 157.
 1902a. *Aparallactus congicus* Werner, Verh. Zool.-Bot. Ges. Wien, 52, p. 346: Lingunda, Belgian Congo.
 1915a. Boulenger, p. 217.
 1925. Werner, 1924, p. 157.
 1907c. *Aparallactus Batesii* Boulenger, Ann. Mag. Nat. Hist. (7), 19, p. 325: 5 miles inland from Kribi, French Cameroon.

- 1908a. Sternfeld, pp. 414, 429.
 1909b. Sternfeld, p. 22.
 1919b. Boulenger, p. 292.
 1925. Werner, 1924, p. 157.
 1910c. *Aparallactus christyi* Boulenger, Ann. Mag. Nat. Hist. (8), **5**, p. 512:
 Mabira Forest, Chagwe, Uganda.
 1915c. Boulenger, p. 634.
 1924b. Loveridge, p. 7.
 1925. Werner, 1924, p. 158.
 1937f. Loveridge, p. 502.
 1938b. Pitman, pp. 40, 190, 191.
 1939c. Scortecci (part), p. 178 (omit record).
 1917. *Aparallactus nigrocollaris* Chabanaud, 1916, Bull. Mus. Hist. Nat.
 Paris, **22**, p. 377, figs. 18-19: French Congo.
 1919b. Boulenger, p. 293.
 1925. Werner, 1924, p. 157.
 1938a. Pitman, p. 198, pl. xvii, fig. 5, col. pl. W, fig. 6.
 1938b. Pitman, p. 296, plates as above (reprint).
 1917. *Aparallactus nigrocollaris Roucheti* Chabanaud, 1916, Bull. Mus.
 Hist. Nat. Paris, **22**, p. 378, figs. 20-21: French Congo.
 1919b. *Aparallactus roucheti* Boulenger, p. 293.
 1925. Werner, 1924, p. 157.
 1923b. *Guyomarchia unicolor* Angel, Bull. Mus. Hist. Nat. Paris, **29**, p. 348,
 figs. 1-4: French Congo (probably from near Sangha).
 1924b. *Aparallactus Graueri* Werner, Sitz. Akad. Wiss. Wien, **133**, p. 42:
 Beni, Belgian Congo.
 1925. Werner, 1924, p. 158.
 1940. *Aparallactus modestus* Bogert, p. 43, fig. 5.
 1941e. Loveridge, p. 123.
 1942e. Loveridge, p. 299.

Further citations of 'modestus' and 'christyi' will be found under *concolor*.

Names. Gray Forest Snake (English); *mboli* (Togo); *kileba* (Wamba)

Description. Rostral nearly twice as broad as deep, the portion visible from above half to three quarters as long as its distance from the frontal; nostril in a divided, rarely semidivided, or entire¹ nasal; internasals as long as, or slightly shorter than, the prefrontals; frontal once and a third to once and two thirds² as long as broad (in the middle), as long as, or much longer than, its distance from the end of the snout, much shorter than the parietals, twice as broad as a supra-

¹In types of *boulengeri*, *nigrocollaris* and *roucheti*.

²In type of *peraffinis* said to be twice but only two thirds in figure of type.

ocular; no loreal¹; preocular 1, in contact with, or rarely separated from², the nasal; eye small, its diameter equal to, or slightly less or slightly greater than, its distance from the mouth; postoculars 1-2, not in contact with the only temporal; temporal 1, rarely 1 + 1³, flanking the outer border of the parietal with a smaller enlarged shield below and posterior to it; upper labials 7, the third and fourth entering the orbit, sixth largest, fifth, or fifth and sixth, or sixth⁴ only in contact with a parietal; first lower labial in contact with its fellow behind the mental; 4, sometimes 3, lower labials in contact with the anterior sublinguals, which are as long as, or slightly longer than the posterior. Midbody scales in 15 rows, smooth; ventrals 134-164; anal entire; subcaudals 32-51.

Based on the descriptions of all species in the synonymy and literature *after* examination of the entire series in the M.C.Z. The following color description is likewise a composite of adult and young from the original descriptions.

Color. Above, black, brown, yellow brown, olive gray, or blue gray with each scale edged with black, uniform, or a more or less faintly indicated pale, yellow, or black nuchal collar; labials pale or dusky reddish yellow, more or less blotched with black. Below, except for outer (lateral) edges of the ventrals which are colored like the back, orange, yellow, white, gray, or grayish green, uniform or edged with lighter, or with dusky or black flecks and infuscations, particularly on tail which may be entirely gray or black beneath. Eye brown (*vide* Pitman).

Size. Total length of ♂, 457 (377 + 80) mm. from Mabira Forest (Pitman, 1937); total length of ♀ (M.C.Z. 9253), 559 (486 + 73) mm. from Lolodorf. Angel mentions 565 mm. for an unsexed snake.

Remarks. The species *plumbeatra* and *petersi* were synonymized by Gunther (1865b), *boulengeri* and *peraffinis* by their own author (1898, p. 192), Werner, who later (1925) added *unicolor*. Parker (in Pitman, 1937) decided that *flavitorques* and *christyi* were nothing but juvenile *modestus*, for Schmidt (1923) had already pointed out the complete transition from collared juveniles to uniform adults in his series of

¹Gough (1903) reports a loreal as present on the right side of a West African snake (presumably split off from the posterior nasal).

²In type of *nigrocollaris* and in M.C.Z. 33961 (Liberia) and on left side of M.C.Z. 29355 (Cameroon).

³See remarks regarding *nigrocollaris* under *Remarks*.

⁴Werner, in describing *graueri*, says third and fourth or fourth and fifth, but this appears to be a *lapsus* for fourth and fifth and fifth and sixth as he has already stated that the third only or third and fourth upper labials enter the orbit in the azygous type which possesses 6 labials on one side, 7 on the other.

nineteen snakes from the Ituri region. The remaining seven species I added to the synonymy in 1942e.

A. nigrocollaris from French Congo was founded on two specimens in which the posterior nasal has fused with the second upper labial, resulting in the second upper labial being in contact with the prefrontal. In *A. n. roucheti*, with same locality and collector, the arrangement is normal. It seems reasonable to assume that the condition is an aberration for in one of our Liberian specimens (M.C.Z. 38961) the second upper labial is broadly in contact with the prefrontal, while in another Liberian snake (M.C.Z. 38962) it is separated. In one Cameroon reptile (M.C.Z. 9253) the second upper labial is narrowly in contact on the left side only, in yet another (M.C.Z. 29355) it is the third upper labial which is narrowly in contact. In view of Pitman having twice obtained *nigrocollaris* in Uganda, I suggest that the condition may crop up in any part of the range from Liberia to Uganda, for the other point of difference — that of the temporal being subdivided — also occurs on one side of the head in a Uganda snake.

Angel's (1925) reference to *modestus* from Kenya Colony, and that of Loveridge (1929b) quoted by Scortecchi (1939c) for a snake taken between Kenya and Ethiopia which was referred to *christyi* are now transferred to *concolor* after reëxamination of both specimens.

Dentition. This has been studied recently by Bogert (1940) as indicated in the generic diagnosis.

Hemipenis. The hemipenis of *modestus* has been described in detail and figured by Bogert (1940).

Sexual dimorphism. Assuming that the Niger specimen mentioned by Boulenger (1896d) and his type of *batesii* were males and not females then ♂♂ have 135–144 ventrals, and 41–51 subcaudals, while ♀♀ have 152–164 ventrals, and 34–44 subcaudals.

Breeding. Without date, at Kribi, a ♀ held 7 eggs measuring about 20 x 5 mm., on November 13, at Mabira Forest, a ♀ held 7 eggs averaging about 25 x 8 mm.

Diet. Nothing known!

Temperament. "Extremely placid and makes no attempt to bite when handled." (Pitman).

Habitat. A forest-dwelling species, taken during clearing operations or in coffee plantations on previously forested areas.

Localities. **Sierra Leone**. **Liberia**. Harbel. **Gold Coast**. **Togo**: Adele (Bismarckburg); Grand Popo; Misahöhe; Wegbe. **Nigeria**: Lagos; Niger River. **British Cameroon**: Bonjongo (? Banjo); Buea; Johann Albrechts Heights. **French Cameroon**:

Bipindi; Bitye; Dibongo near Edea; Kribi; Ja River; Lolodorf; Longji; Metet; Mukonje Farm, Mundame; Sakbayeme; Yaunde. **Spanish Guinea:** Esong (as Esosung, Bakossiberge). **French Congo:** Fernand Vaz; Lambarene; Loudinia-Niari, Niari River; ? near Sangha; Sette Kama (Cette Cama). **Belgian Congo:** Avakubi Banzyville; Beni; Kai Bumba; Lingunda; Lubué, Kasai; Lukolela; Makaia Ntete; Medje; Ngombe, Kasai; Saidi; Stanleyville; Temvo; Zongo. **Uganda:** Bisu; Budongo Forest; Bundi-bugyo; Mabira Forest; ¹Rom Mtn., northeast Acholi; ¹Semliki Valley.

The two **Kenya Colony** records, as mentioned above, were based on misidentified examples of *concolor*.

Range. Equatorial Africa from Sierra Leone east to Uganda.

APARALLACTUS LIDDIARDAE Parker

- 1908b. *Aparallactus bocagii* Sternfeld (not Boulenger), pp. 219, 234 (Togo).
 1909a. Sternfeld, p. 22.
 1933. *Aparallactus liddiardae* Parker, Ann. Mag. Nat. Hist. (10), 12, p. 545: Jos, northern Nigeria.

Description. Rostral broader than deep, the portion visible from above less than half as long as its distance from the frontal; nostril in a divided nasal; internasals shorter than the prefrontals; frontal once and a half as long as broad (in the middle), much longer than its distance from the end of the snout, slightly shorter than the parietals; no loreal; preocular 1, in contact with the nasal; eye small, its diameter equal to twice its distance from the mouth; postocular 1, not in contact with the anterior temporal; temporals 1 + 1; upper labials 7, the third and fourth entering the orbit, fifth in contact with a parietal; first lower labial in contact with its fellow behind the mental; 4 lower labials in contact with anterior sublinguals, which are longer than the posterior. Midbody scales in 15 rows, smooth; ventrals 170 (Togo) to 174 (Nigeria); anal entire; subcaudals 41 (Togo) to 45 (Nigeria).

Based on description of type and data from Sternfeld (1908b).

Color. Above gray, upper surface of the head darker, edges of parietal and temporal shields stippled with black, ocular region and lip below the eye, black; a broad black nuchal collar; the third scale-row on each side and the seven mid-dorsal rows each with a dark spot, the

¹ As *nigrocollaris*.

spots of the middle row largest, and forming a narrow line which is continued forward on to the parietal shields. Below, pale gray.

Size. Total length of type, 80 (44 + 36) mm.

Diet. A relatively large centipede.

Localities. **Togo:** Sausane Mangu. **Northern Nigeria:** Jos.

Range. Togo east to Nigeria.

APARALLACTUS CONCOLOR (Fischer)

- 1884a. *Uriechis concolor* Fischer, Jahrb. Hamburg. Wiss. Anst., 1, p. 4,
pl. i, fig. 1: Arusha, Tanganyika Territory.
- 1888b. Günther, p. 325.
- 1895h. *Aparallactus concolor* Boulenger, p. 172.
- 1896d. Boulenger, p. 257.
- 1896e. Boulenger, p. 216.
- 1896. Tornier, p. 79.
- *1896c. Boulenger, p. 21.
- 1897g. Boulenger, p. 279.
- 1897. Tornier, p. 65.
- *1902b. Mocquard, p. 406.
- 1907. Lönnberg, p. 16.
- 1908c. Sternfeld, p. 241.
- 1909d. Boulenger, p. 311.
- 1910. Lepri, p. 327.
- 1910a. Sternfeld, p. 36.
- 1912. Hobley, p. 53.
- 1912c. Sternfeld, p. 274.
- 1913. Lönnberg & Andersson, p. 5.
- 1915c. Boulenger, p. 634.
- 1915d. Boulenger, p. 655.
- 1916a. Loveridge (part), p. 86.
- 1923b. Calabresi, p. 162.
- 1924b. Loveridge, p. 7.
- 1925. Werner, 1924, p. 157.
- 1927. Calabresi, pp. 33, 56.
- 1929h. Loveridge, p. 34.
- 1934c. Scortecchi, p. 74, fig. 32.
- 1936j. Loveridge, p. 269.
- *1936e. Parker, p. 608.
- 1937f. Loveridge, pp. 493, 496.
- 1937. Pitman, p. 335, pl. xii, fig. 5, col. pl. M, fig. 5.
- 1938a. Pitman, p. 217.
- 1938b. Pitman, pp. 40, 188, 315, plates as above (reprint).

- *1939a. Scortecci, p. 285.
- 1939c. Scortecci, p. 175 (as *A. c. concolor*).
- 1940a. Scortecci, p. 136.
- ?1896a. *Aparallactus lunulatus* Boulenger (not Peters), p. 554.
- ?1928b. Scortecci, p. 306.
- 1925a. *Elapops modestus* Angel (not Günther), p. 36.
- *1929h. *Aparallactus christyi* Loveridge (not Boulenger), p. 34.
- *1939c. Scortecci (part), p. 178.
- *1931c. *Aparallactus concolor boulengeri* Scortecci, Atti. Soc. Ital., **70**, p. 212: Villaggio Duca Abruzzi and inland from Mogadiscio, Italian Somaliland.
- *1934c. Scortecci, p. 75.
- *1939c. Scortecci, p. 177, figs. 99–100.

Names. Plumbeous Centipede-eater (English); *mowa* (Teita, but generic).

Description. Rostral nearly twice as broad as deep, the portion visible from above half to two thirds as long as, or even equal to, its distance from the frontal; nostril in a divided, semidivided, or entire nasal (which is fused with a labial on one side of the head in the cotype ♀ of *boulengeri*); internasals much shorter than the prefrontals; frontal once and a half to twice as long as broad (in the middle), much longer than its distance from the end of the snout, as long as, or slightly shorter than, the parietals; once and two thirds to twice as broad as a supraocular; no loreal; preocular 1, not, or but rarely¹, in contact with the nasal; eye small, its diameter equal to, or greater than, its distance from the mouth; postocular 1, not in contact with the anterior temporal; temporals 1 + 1; upper labials 7, the third and fourth entering the orbit, fifth largest and in contact with a parietal; first lower labial in contact with its fellow behind the mental; 4 lower labials in contact with the anterior sublinguals, which are about as long as the posterior. Midbody scales in 15 rows, smooth; ventrals 140²–173³; anal entire; subcaudals 43–77.

Based on original descriptions, literature, and Kenya material in the M.C.Z. and U.S.N.M.

*Some or all of these specimens have the preocular in contact with the nasal a character of *boulengeri* which may yet prove to be a recognizable race, though the name is preoccupied by *boulengeri* Werner, 1896.

¹ In Athi Plains specimen (Mocquard) and Kenya-Ethiopian frontier snake (Loveridge), types of *boulengeri*, etc.

² In "*lunulatus*" from Let Marefia; Calabresi's record of 133 is rejected.

³ In "*lunulatus*" from Isale; if these two are not *concolor* then the range is 143–169.

Color. Above, uniformly plumbeous. Below, rather paler, sometimes almost white. (♂ and ♀ adults. Tanganyika and Kenya. Loveridge).

Above, uniformly brown with a light purplish reflection. Below, slightly lighter, (adult. Mogadish, Italian Somaliland. Lepri, 1910).

Above, rather pale yellowish, a large transverse black band on hinder part of head and nape, each dorsal scale edged with brown. Below, uniformly whitish yellow. (♂ ♀ adults. Durgale to Magghiole, Italian Somaliland. Calabresi, 1927).

Above, pale maroon, a four-scale wide transverse black band on hinder part of head and nape, pre- and postocular and third or third and fourth labials black. Below, very pale rosy yellowish. (Neghelli, Ethiopia. Scortecci, 1940a).

Size. Total length of type, ?♂, 360+ (300 + 60+) mm. from Arusha; and total length of ♀ (M.C.Z. 40711), 520 (420 + 100) mm. from Voi.

Remarks. Werner's (1908) reference to *concolor* in the Sudan appears to have been based on a misidentification, possibly of a *Prosymna*. The snake from Kitui, identified by Boulenger, and listed by Loveridge (1916a) is evidently something else.

Parker (1936e) synonymized *boulengeri* with *concolor* the same year that I (1936j) placed it in the synonymy of *uluguruensis*! Actually it is intermediate between the two, agreeing with *concolor* in the first lower labial being in contact with its fellow, but agreeing with *uluguruensis* in having the preocular in contact with the nasal. Of these characters that of the lower labials is more constant and important in the genus so I admit that I was wrong in my disposition of *boulengeri*.

I am inclined to think — on account of the extensive range in variation in ventral and subcaudal counts — that we really are dealing with two forms and that a race — for which the name *boulengeri* is not available — does occur in Italian Somaliland. The question can only be decided by someone assembling all the *concolor* material, sexing it, and seeing whether there is any discernible geographical significance or correlation between higher scale counts and naso-preocular contact. The data at my disposal does not reflect it, but perhaps authors have referred to *concolor*, without comment, snakes that might have been assigned to "*boulengeri*".

There is an undoubted tendency in northern Kenya and southern Somaliland for the preocular to be in contact with the nasal. In the northern part of its range, *concolor* certainly exhibits a wider variation in the number of ventrals, which do not go above 158 in the south. The coloration in that region also appears to be uniformly plumbeous,

thereby differing from many specimens described from Somaliland and Eritrea.

Diet. A centipede, about as long as a finger and nearly the same diameter as the snake itself, in Kenya (Sternfeld).

Localities. **Anglo-Egyptian Sudan:** Lado. **Eritrea:** Isole¹ near Massaua. **Ethiopia:** Between Ethiopia and Kenya; between Gara Mulata and Lake Haramaya; Let Marefia³, Shoa; Neghelli. **Italian Somaliland:** Balad; Bardera; Belet Amin; Durgale to Magghiole; Kismayu; between Lugh and Matagoi; Mofi; Moga-dish; between Obbia and Tobungab; Villa Duca de Abruzzi. **Kenya Colony:** Athi Plains; Boran country; Bulesa; Bura; Lamu Island; Lodwar; Mount Mbololo; Mtito Andei; east of Tsavo (Izavo); Turkana; Voi. **Tanganyika Territory:** Arusha; Usambara.

Range. Anglo-Egyptian Sudan east to Eritrea and south to extreme northern Tanganyika Territory.

APARALLACTUS LUNULATUS (Peters)

- 1854. *Uriechis lunulatus* Peters, Monatsb. Akad. Wiss. Berlin, p. 623: Tete, Mozambique.
- 1855. Peters, p. 53.
- 1882a. Peters, p. 113, pl. xviii, fig. 2.
- 1888b. Günther, p. 324.
- 1891a. Boulenger, p. 308.
- 1896a. Bocage, p. 100.
- 1895h. *Aparallactus lunulatus* Boulenger, p. 172.
- 1896d. Boulenger, p. 258.
- 1907a. Boulenger, p. 12.
- 1910a. Sternfeld, p. 36.
- 1915a. Boulenger, p. 216.
- 1915c. Boulenger, p. 634.
- 1917. Sternfeld, p. 481.
- 1924b. Loveridge, p. 7.
- 1925. Werner, 1924, p. 158.
- 1928d. Loveridge, p. 57.
- 1933m. Witte, p. 96.
- 1934. Pitman, p. 298.
- 1937f. Loveridge, p. 496.
- 1937b. Mertens, p. 14.

Further citations of '*lunulatus*' will be found under *concolor* and *c. bocagii*.

¹ Recorded as *lunulatus* by Boulenger and Scortecci respectively, have not been reëxamined.

Names. Blotched-back Centipede-eater (English); *bubse* (Tete).

Description. Rostral nearly twice as broad as deep, the portion visible from above one third to half as long as its distance from the frontal; nostril in a divided or entire¹ nasal; internasals much shorter than the prefrontals; frontal once and a half to once and two thirds as long as broad (in the middle), much longer than its distance from the end of the snout, as long as, or slightly shorter than, the parietals; once and two thirds to twice as broad as a supraocular; no loreal; preocular 1, in contact with the nasal; eye small, its diameter equal to, or greater than, its distance from the mouth; postocular 1, not in contact with the anterior temporal; temporals 1+1; upper labials 7, the third and fourth entering the orbit, fifth largest and in contact with a parietal; first lower labial in contact with its fellow behind the mental; 4, sometimes 3², lower labials in contact with the anterior sublinguals, which are about as long as, or shorter than, the posterior. Midbody scales in 15 rows, smooth; ventrals 151-167³; anal entire; subcaudals 48-58.

Based on original description, literature, and two specimens in the Museum of Comparative Zoölogy.

Color. Composite. Above, olive, olive gray, or olive green, dark or light brown, uniform or with a light yellow collar preceding a black transverse band which may be followed by a series of black bars or spots; a black fleck below the eye; each scale of back edged with darker. Below, white or greenish yellow.

Size. Total length of ♂ (M.C.Z. 23075), 288 (232 + 56) mm. from Mukwese, being surpassed by the unsexed type, measuring 415 (325 + 90) mm., and a 485 (385 + 100) mm. specimen from Punda Maria, Transvaal.

Remarks. The records of Boulenger (1896a) and Scortecci (1928b, repeated 1939c), and listing of Zavattari (1930b) of two "*lunulatus*" from Ethiopia and Eritrea respectively, have been transferred arbitrarily to *concolor*. This has been done not merely because *lunulatus* is otherwise unknown north of Tanganyika, but because the scale counts of both and color (of the one furnished) approximate more nearly to those of *concolor*, with which species they appear to have been identified on the basis of Boulenger's (1896d) key which fails to distinguish *concolor* as now understood.

¹ Entire in Victoria Falls specimen (M.C.Z. 21481).

² Three in Victoria Falls and Mukwese specimens in M. C. Z. Perhaps these are aberrant *c. capensis*, and the type and Boulenger's two snakes, which had four, represent true *lunulatus* which would then agree with its preceding allies in this character.

³ 167 in a Punda Maria, Transvaal, snake (FitzSimon's letter of 18, vii, 1941), otherwise 161.

Indeed it seems highly probable that the eleven recorded, and widely scattered specimens of *lunulatus* may prove to be only aberrant *c. capensis* in which the first lower labials are in contact behind the mental — throwbacks to their ancestral condition. This appears to be the only difference between the two if one excepts the strange coloring of the type, for subsequent specimens appear to be colored like *c. capensis*. In this connection it may be noted also that Peters himself recorded both species from Tete, and both occur at Victoria Falls.

Localities. **Belgian Congo:** Dika. **Tanganyika Territory:** Duma; Lake Tanganyika; Mukwese near Manyoni; Rufigi River; **Mozambique:** Cheringoma Farm, Inhaminga; Tete. **Nyasaland:** Lake Nyasa. **Northern Rhodesia:** Ulungu Mountain west of Luangwa River; Victoria Falls. **Transvaal:** Punda Maria.¹

Range. Belgian Congo and Northern Rhodesia east to Mozambique, south to Transvaal.

APARALLACTUS JACKSONII (Günther)

- 1888b. *Uriechis Jacksonii* Günther, Ann. Mag. Nat. Hist. (6), 1, p. 325, pl xix, fig. E: Foot of Mount Kilimanjaro, Tanganyika Territory.
- 1895h. *Aparallactus jacksonii* Boulenger, p. 172.
- 1896d. Boulenger, pp. 256, 649.
- 1896. Tornier, p. 79.
- 1898a. Boulenger, p. 721.
- 1897. Tornier, p. 65.
- 1907. Lönnberg, p. 16.
- 1910a. Sternfeld, p. 35.
- 1912. Hobley, p. 53.
- 1915c. Boulenger, p. 633.
- 1916a. Loveridge, p. 86.
- 1916b. Loveridge, p. 122.
- 1918a. Loveridge, p. 325.
- 1923e. Loveridge, p. 889.
- 1924b. Loveridge, p. 7.
- 1925. Werner, 1924, p. 157.
- 1928g. Loveridge, p. 41.
- 1929h. Loveridge, p. 34.
- 1936. Roux, p. 178.
- 1937f. Loveridge, p. 496.
- 1937d. Mertens, p. 8.
- 1939c. Scortecci, p. 174.
- 1942e. Loveridge, p. 300.

Further citation of '*jacksonii*' will be found under *turneri*.

¹167 in a Punda Maria, Transvaal, snake (FitzSimon's letter of 18, vii, 1941), otherwise 161.

Names. Jackson's Centipede-eater (English).

Description. Rostral nearly twice as broad as deep, the portion visible from above one third to half as long as its distance from the frontal; nostril in a semidivided or entire nasal; internasals much shorter than the prefrontals; frontal once and a half to once and two thirds as long as broad (in the middle), much longer than its distance from the end of the snout, as long as, or slightly shorter than, the parietals, once and a half to twice as broad as a supraocular; no loreal; preocular 1, in contact with the nasal; eye small, its diameter equal to, or greater than, its distance from the mouth; postoculars 2, in contact with the anterior temporal; temporals 1 + 1; upper labials 7, the third and fourth entering the orbit, sixth largest but *not* in contact with a parietal; first lower labial in contact with, very rarely separated from¹, its fellow behind the mental; 3 lower labials in contact with the anterior sublinguals, which are about as long as, or slightly longer than, the posterior. Midbody scales in 15 rows, smooth; ventrals 134–157; anal entire; subcaudals 33–46.

Based on original description, literature, and eight specimens.

Color. Above, head black, a six-scale wide transverse black band, edged before and behind by scale-wide bands of bright yellow, on nape; back and tail a delicate pinkish brown (in life) or terra cotta with, or without, a fine black vertebral line, more rarely a lateral series of white scales bordered with black above and below, which, if confluent, would form lateral lines. Below, bright yellow (in life) or white.

Size. Total length of ♂, 276 (228 + 48) mm. from foot of Mount Longido; total length of ♀ (M.C.Z. 48442), 259 (213 + 46) mm. from Nchingidi.

Sexual dimorphism. ♂♂ have 134–144 ventrals, and 35–46 subcaudals. ♀♀ have 148–157 ventrals, and 33–44 subcaudals.

Temperament. Inoffensive, not attempting to bite.

Habitat. This species favours the hot upland steppe with scattered acacia forest where, during the rains, I collected half-a-dozen beneath boulders, stones and logs in the centipede-infested region at the western foot of Mount Longido.

Elsewhere² I have recounted how one of these snakes attempted to cross the face of a recumbent trooper encamped at the foot of Mount Meru, and was subsequently captured beneath his blankets.

Localities. **Ethiopia:** Between Dime (? Dima) and Lake Ru-

¹ Separated in one of a series of six Longido snakes (U.S.N.M. 62919).

² Fauna (Philadelphia), 4, p. 119. December, 1942.

dolf. **Kenya Colony:** Kell's Farm near Nairobi; Lamu Island¹ (!); Lat. 0°0, Long. 39E.; Naivasha; "Uganda".² **Tanganyika Territory:** foot of Mt. Kilimanjaro; foot of Mt. Longido; Matete Bach; foot of Mt. Meru near Ngare Mtoni; Nchingidi, Rondo Plateau; Ngare na Nyuki; Tanga (!).

Range. Dry uplands from southern Ethiopia to southeastern Tanganyika Territory.

APARALLACTUS WERNERI Boulenger

- 1895h. *Aparallactus Werneri* Boulenger, Ann. Mag. Nat. Hist. (6), 16, p. 172 :
Usambara Mountains, Tanganyika Territory.
- 1896d. Boulenger, p. 257.
- 1896. Tornier, p. 79.
- 1897c. Mocquard, p. 123.
- 1897. Tornier, p. 65.
- 1898. Boettger, p. 111.
- 1910a. Sternfeld, p. 35, fig. 41.
- 1911b. Nieden, p. 442.
- 1915c. Boulenger, p. 633.
- 1923e. Loveridge, p. 889.
- 1924b. Loveridge, p. 7.
- 1925. Werner, 1924, p. 157.
- 1926. Werner, p. 248.
- 1928c. Barbour & Loveridge, p. 131.
- 1928g. Loveridge, p. 41.
- 1937f. Loveridge, p. 502.
- 1942e. Loveridge, p. 301.

Names. Werner's Centipede-eater (English); *nyoka usambia* (Sham-baa, but applied by them to *Neusterophis o. uluguruensis* also).

Description. Rostral nearly twice as broad as deep, the portion visible from above half to two thirds as long as its distance from the frontal; nostril in an entire (or semidivided³) nasal; internasals shorter than, or equal to, the prefrontals; frontal once and a third to once and two thirds as long as broad (in the middle), much longer than its distance from the end of the snout, as long as, or slightly shorter than, the parietals; once and two thirds to twice as broad as a supraocular; no loreal; preocular 1, in contact with the nasal; eye small, its diameter

¹ Sternfeld's (1910a) record, more probably an *A. turneri*.

² Boulenger's (1896d, p. 649) record, for "Uganda" on this page read Kenya Colony.

³ *Fide* Tornier, but entire in all our fifty snakes.

equal to, or greater than, its distance from the mouth; postoculars 2, very rarely 1¹, in contact with the anterior temporal; temporals 1 + 1; upper labials 6, the second and third entering the orbit, fifth largest but *not* in contact with a parietal; first lower labial not, or but very rarely², in contact with its fellow behind the mental; 3 lower labials in contact with the anterior sublinguals, which are about as long as, or slightly longer than, the posterior. Midbody scales in 15 rows, smooth; ventrals 141–161; anal entire; subcaudals 32–45.

Based on original description, literature, and over fifty specimens in the Museum of Comparative Zoölogy.

Color. Above, head black, a six-scale wide transverse black band, edged before, and sometimes behind, by scale-wide bands of olive or yellow, on nape; back and tail usually olive, rarely pale brown. Below, throat whitish tinged with yellow, rest of undersurface bright lemon yellow.

Size. Total length of a cotype, 390 (325 + 65) mm. from Usambara Mountains, and total length of a ♀ (M.C.Z.), 354 (295 + 59) mm. from Amani.

Sexual dimorphism. Most unfortunately, in 1928, I included two young males in a series of thirty-three females, thus masking the dimorphism in ventral counts. I have carefully rechecked all extremes of the series of fifty specimens now available and find that ♂♂ have 141–151 ventrals, and 35–45 subcaudals, while ♀♀ have 154–161³ ventrals, and 32–42 subcaudals.

Breeding. In November, at Amani, 17 out of 31 females held large well-developed, very elongated eggs, the largest (on 25.xi.26) measuring 39 x 6 mm. Seven snakes held 2 eggs, eight had 3 eggs, and two had 4 eggs.

Diet. Centipedes in each of four snakes.

Enemies. One was recovered from the stomach of a *Calamelaps u. unicolor*.

Habitat. I found these snakes beneath logs, bark and stones, both within and without the rain forest but chiefly along its edge. Some were unearthed by hoeing up grass and weeds on the outskirts of the forest. In fact its habitat is very similar to that of the North American ring-necked snakes (*Diadophis* spp.) which it so closely resembles in color, markings and size. A montane species.

¹ In only one of a series of fifty snakes.

² On one side only in two out of fifty snakes.

³ Not 163 as given in Barbour & Loveridge, 1928c, p. 131, recounted as 161.

Localities. Tanganyika Territory: Amani; Baglio; Bumbuli; Kizerui; Kukulio; Magrotto; Mkarazi; Mt. Lutindi; Nguelo; Tanga; Vituri.

These places, with the exception of Tanga, are all in one or other of the four mountains—Magrotto, Pare, Uluguru, Usambara. Mocquard (1897c) is responsible for the Tanga record, Tanga is the port for Usambara which is about forty miles away, and pending confirmation this record for Tanga should be accepted with reserve.

Range. Mountains of eastern Tanganyika Territory.

APARALLACTUS TURNERI Loveridge

?1910a. *Aparallactus Jacksoni* Sternfeld (part, not Günther), p. 35.

1935c. *Aparallactus turneri* Loveridge, Bull. Mus. Comp. Zool., 79, p. 9:
Sokoki Forest, near Malindi, Kenya Colony.

1936j. Loveridge, p. 268.

1937f. Loveridge, p. 493.

Description. Rostral nearly twice as broad as deep, the portion visible from above one third to two thirds as long as its distance from the frontal; nostril in an entire nasal; internasals much shorter than the prefrontals; frontal once and a half to once and two thirds as long as broad (in the middle), longer than its distance from the end of the snout, as long as the parietals; once and two thirds to twice as broad as a supraocular; no loreal; preocular 1, in contact with the nasal; eye small, its diameter greater than its distance from the mouth; postoculars 2, rarely 1, in contact with the anterior temporal; temporals 1 + 1; upper labials 6, the second and third entering the orbit, fifth largest but *not* in contact with a parietal; first lower labial in contact with its fellow behind the mental; 3 lower labials in contact with the anterior sublinguals, which are about as long as the posterior. Mid-body scales in 15 rows, smooth; ventrals 120–139; anal entire: subcaudals 31–42.

Based on the type series of four males and two females.

Color. Above, head black with white blotches, one anterior, one posterior, to the eye, the second blotch larger and extending upwards on to the anterior temporal; a black transverse band, sometimes edged before and behind by scale-wide light bands (which may break up into spots), on the nape, the anterior, being just posterior to the parietals, tends to separate the black of the head from the black of the nape; back and tail a pallid, pinkish brown, the edges of each scale darker,

and with, or without, a fine black vertebral line. Below, white, uniform except for a slight encroachment of the black nape patch in two downward-pointing patches.

Size. Total length of ♂, 202 (167 + 35) mm. from Peccatoni; total length of ♀, 196 (165 + 31) mm. from near Witu.

Sexual dimorphism. ♂♂ have 120–129 ventrals, and 33–42 subcaudals. ♀♀ have 134–139 ventrals, and 31–37 subcaudals.

Habitat. Beneath logs and stoïes on the sandy coastal plain.

Localities. **Kenya Colony:** ? Lamu Island¹; Mkonumbi; near Witu; Peccatoni; Sokoki Forest.

Range. Kenya Colony coast between Lamu and Malindi.

APARALLACTUS CAPENSIS BOCAGII Boulenger

- 1895a. *Uriechis capensis* Bocage (part, not Smith), p. 127: Gambos; Novo Redondo; and Quindumbo, Angola.
- 1895h. *Aparallactus guentheri* Boulenger (part), p. 172: Angola only.
- 1895h. *Aparallactus bocagii* Boulenger, Ann. Mag. Nat. Hist. (6), **16**, p. 173: Angola.
- 1896d. Boulenger, p. 259.
- 1905c. Boulenger, p. 114.
- 1915a. Boulenger, p. 216.
1925. Werner, 1924, p. 158.
- 1933f. Angel (part), p. 179 (omit Togo from range).
- 1937b. Monard, p. 129.
- 1897a. *Uriechis Guentherii* Bocage, p. 201.
- 1897a. *Uriechis Bocagi* Bocage, p. 201.
- ?1908c. *Aparallactus lunulatus* Sternfeld (not Peters), p. 247.
- 1910c. *Aparallactus Lubberti* Sternfeld, Mitt. Zool. Mus. Berlin, **5**, p. 57: Between Omaruru and Okanjanda (?Okahandja), South West Africa.
- 1910b. Sternfeld, p. 30, fig. 35.
1925. Werner, 1924, p. 157 (as *luebberti*).
- ?1933m. *Aparallactus punctatolineatus* Witte, p. 96.
- ?1937b. *Aparallactus nigriceps* Mertens (not Peters), p. 14.

Further citation of '*bocagii*' will be found under *lidiardae*.

Names. Angolan Centipede-eater (English).

Description. Rostral nearly twice as broad as deep, the portion visible from above one third to two thirds as long as its distance from

¹ It seems probable that Sternfeld's (1910a) specimen of "*jacksonii*" from Lamu should be referred to *turneri* which occurs on the opposite mainland at Mkonumbi.

the frontal; nostril in an entire or divided² nasal; internasals much shorter than the prefrontals; frontal once and a half to once and two thirds as long as broad (in the middle), much longer than its distance from the end of the snout, as long as, or slightly shorter than, the parietals; once and two thirds to twice as broad as a supraocular; no loreal; preocular 1, in contact with, rarely separated from¹, the nasal; eye small, its diameter equal to, or greater than, its distance from the mouth; postocular 1, not in contact with the anterior temporal; temporals 1 + 1, rarely 0 + 1; upper labials 7, rarely 6², the third and fourth, rarely second and third², entering the orbit, fifth, rarely fourth, largest, and fifth, or fourth and fifth in contact with a parietal; first lower labial not in contact with its fellow behind the mental; 3 lower labials in contact with the anterior sublinguals, which are as long as, or slightly longer than, the posterior. Midbody scales in 15 rows, smooth; ventrals³ 168-191; anal entire⁴; subcaudals 35⁵ or 44-59.

The *above description*, being based on literature only, *should be received with reserve* and is subject to correction.

Color. Above, head black with white blotches, one anterior, one posterior, to the eye, the second blotch larger and extending upwards to the anterior temporal; a black transverse band, edged anteriorly with yellow, on nape; back and tail reddish brown, a small brown spot in the centre of each scale, the spots forming longitudinal lines. Below, white.

Size. Total length of type, 272 mm. from Gambos, of a ♀, 330 (285 + 45) mm. from between Benguela and Bihe.

Remarks. Bocage (1895a), in addition to a true *capensis* from Bibala (if the ventral count of 161 is correct, in which case it is the only example from the West with so low a count), had two snakes with entire nasals from Gambos and Novo Redondo. Without seeing them, Boulenger (1895h) made these the cotypes of a new species — *bocagii*, of which he had no material in the British Museum. Bocage, however, had also listed a specimen from Quindumbo with a divided nasal, on account of this character, Boulenger added its high ventral count (180) to that of his new species *guentheri* and added Angola to the range of *guentheri*. I regard *guentheri* as a synonym of *c. capensis*, a species which, though normally possessing an entire nasal, produces

¹ Not in contact in Sternfeld's two Chifumbazi specimens of *lunulatus*.

² In type of *lubberti*, and others.

³ Said to be 161 in a snake from Bibala, *vide* Bocage.

⁴ Bocage has corrected his (1895a) misstatement about divided anals and paired subcaudals.

⁵ In the Benguela to Bihe specimen which I suggest has a mutilated tail.

individuals here and there in the east in which it is divided. In this connection it is interesting to note that such cases appear rare indeed in the southeast for FitzSimons writes me that the nasal is entire in all 32 examples of *c. capensis* and 7 (of what I should call) *bocagii* in the collection of the Transvaal Museum.

Since its description in 1895, only one specimen of *bocagii* has been recorded (Boulenger, 1905c) as such, for I reject Sternfeld's (1908b, p. 219) record of its occurrence in Togo, a statement apparently based on a misidentified specimen of the recently-described *liddiardae*.

Later, however, Sternfeld (1910c) described *lubberti*, differing only from *bocagii* in having a divided nasal and six upper labials, of which the second and third (left), or third (right) only enter the orbit, consequently the fourth (instead of the fifth) upper labial is largest and in contact with the parietal. This reduction in labials is a variation common to four species of the genus at least.

I am less confident in suggesting that Sternfeld's (1908c) *lunulatus* material with 168-172 ventrals is referable to *bocagii*, much turns on the stability of the character involving the forming of a suture by the first pair of lower labials. The snake requires reëxamination.

Witte (1933m) has recorded a snake from the southern Belgian Congo under the name of *punctatolineatus*, but gives no scale counts. On geographical grounds I tentatively refer it to *bocagii* for, if its second and third labials enter the orbit, as one may justifiably assume, then it would naturally run down to *punctatolineatus* in Boulenger's key.

The snake that Mertens (1937b) refers to *nigriceps* has a similar labial condition but its high ventral count (178) precludes its reference to *nigriceps* (108-123) or *capensis* (131-166) though the record involves extension of the range of *bocagii* south to the Transvaal. On appealing to Mr. V. FitzSimons for light on this point he, with customary kindness, furnished me with scale counts of all "*capensis*" in the Transvaal Museum. These show that what I regard as *bocagii*, i.e. snakes with 169-180 ventrals, occurs sparsely throughout the Transvaal, both *bocagii* and *c. capensis* occurring together at Lydenburg, Pretoria, and Johannesburg. Were we to assume that snakes from these three places were all of one form we would be confronted with the absurdly large ventral range of 138-180 for so small a snake. Personally I feel that *bocagii* is little more than a race of *c. capensis*, such treatment, however, would involve regarding almost the entire Transvaal as an area of intergrades, at the present stage of our knowledge, therefore, it seems advisable to treat them as subspecies.

Localities. ?**Belgian Congo:** Elisabethville. **Angola:** Benguela to Bihe; Bibala¹; Bingondo; Gambos; Novo Redondo; Quindumbo. **South West Africa:** Okanjande to Omaruru. **Transvaal:** Gravelotte; Johannesburg²; Lydenburg²; Malelane Camp, Crocodile River, Kruger National Park; Pretoria²; Vaalwater. **Mozambique:** Chifumbazi.

Range. Angola and South West Africa, east through southeastern Belgian Congo to *extreme* western Mozambique, south through the Transvaal where it occurs alongside *c. capensis* in several localities.

APARALLACTUS CAPENSIS CAPENSIS Smith

1849. *Aparallactus capensis* A. Smith, Ill. Zool. S. Africa, **3**, App., p. 16:
Kaffirland to the eastward of Cape Colony.
- 1895h. Boulenger, p. 173.
- 1896d. Boulenger, p. 259.
1896. Tornier, p. 79.
1898. Selater, p. 100.
1898. Werner, 1896-7, p. 146.
- 1902b. Boulenger, p. 18.
- 1907j. Boulenger, p. 487.
- 1907a. Roux, p. 81.
- 1908b. Boulenger, p. 230.
1908. Gough, p. 33.
1908. Odhner, p. 5 (? part, *nigriceps*).
- 1909a. Chubb, p. 596.
- 1909b. Chubb, p. 36.
- 1910b. Boulenger, p. 516.
- 1910a. Sternfeld, p. 36.
1912. FitzSimons, F. W., p. 128.
1913. Hewitt & Power, p. 164.
- 1915a. Boulenger, p. 216.
- 1915c. Boulenger, p. 634.
- 1923e. Loveridge, p. 889.
- 1924b. Loveridge, p. 7.
1925. Werner, 1924, p. 158.
1934. Pitman, p. 298.
- 1935b. FitzSimons, V., p. 323.
- 1936j. Loveridge, p. 268.
- 1937a. FitzSimons, V., p. 263.
- 1937f. Loveridge, p. 496.

¹ But said to have 161 ventrals.

² Where it occurs alongside *c. capensis*.

- 1937a. Parker, p. 630.
1937e. Hewitt, p. 64, pl. xviii, fig. 1.
1937. Uthmöller, p. 123.
1939b. FitzSimons, V., p. 24.
1940. Bogert, p. 43.
1941. Moreau & Pakenham, p. 109.
1849. *Elapomorphus capensis* A. Smith, Ill. Zool. S. Africa, **3**, App., p. 16:
Kaffirland to the eastward of Cape Colony.
1863a. *Cercocalamus collaris* Günther, Ann. Mag. Nat. Hist. (3), **11**, p. 21,
pl. iii, fig. A: "Central America" (in error).
1895. Günther, Biol. Centrali Americana, Rept., p. 157.
1865a. *Uriechis capensis* Günther, p. 89.
1866. Jan, livr. 15, pl. i, fig. 5.
1882a. Bocage, p. 288.
1882a. Peters, p. 112.
1884a. Rochebrune, p. 154 (ignored).
1887h. Boulenger, p. 175.
1888b. Günther, p. 324.
1889. Boettger, p. 293.
1891a. Boulenger, p. 308.
1891a. Matschie, p. 609.
1892. Müller, p. 207.
1893. Günther, 1892, p. 555.
1895a. Bocage, p. 127.
1896a. Bocage, p. 94.
1898. Johnston, p. 361a.
1895h. *Aparallactus gunctheri* Boulenger (part), Ann. Mag. Nat. Hist. (6),
16, p. 172: East and Central Africa (exclude Angola).
1896d. Boulenger (part), p. 259, pl. xi, fig. 2.
1902b. Boulenger, p. 18.
1910b. Boulenger, p. 516.
1910a. Sternfeld, p. 36.
1912. FitzSimons, F. W. (part), p. 128.
1915a. Boulenger (part), p. 216.
1915c. Boulenger (part), p. 634.
1924b. Loveridge, p. 7.
1925. Werner (part), 1924, p. 158.
1934. Pitman, p. 298.
1937f. Loveridge, p. 496.
1937b. Monard (part), p. 129.
1941. Moreau & Pakenham, p. 109.
1895h. *Aparallactus punctatolineatus* Boulenger, Ann. Mag. Nat. Hist. (6),
16, p. 173: Angola.
1896d. Boulenger, p. 261.
1897a. Bocage, p. 201.

- 1915a. Boulenger, p. 217.
 1915c. Boulenger, p. 634.
 1925. Werner, 1924, p. 158.
 1934. Pitman, p. 298.
 1895h. *Aparallactus nigriceps* Boulenger (part, not Peters), p. 173.
 1896d. Boulenger (part), p. 260.
 1896. Tornier, p. 79.
 1897. Tornier, p. 65.
 1910a. Sternfeld, p. 36.
 1915c. Boulenger (part), p. 634.
 1924b. Loveridge, p. 7.
 1924. Werner (part), 1924, p. 158.
 1897a. *Uriechis punctatolineatus* Bocage, p. 201.

Further citations of 'capensis', 'guentheri', and 'punctatolineatus' will be found under *c. bocagii*.

Names. Cape Centipede-eater or Black-headed Snake (English); *yamitera* (Makonde: Tanganyika).

Description. Rostral nearly twice as broad as deep, the portion visible from above one third to two thirds as long as its distance from the frontal; nostril in an entire, semidivided, or divided nasal; internasals shorter than the prefrontals; frontal once and a half to once and two thirds as long as broad (in the middle), much longer than its distance from the end of the snout, as long as, or slightly shorter than, the parietals, once and two thirds to twice as broad as a supraocular; no loreal; preocular 1, in contact with the nasal; eye small, its diameter equal to, or greater than, its distance from the mouth; postocular 1, not, or but very rarely¹, in contact with the anterior temporal; temporals 1 + 1; upper labials 7, sometimes 6, the third and fourth, or sometimes the second and third, entering the orbit, fifth largest and in contact with, very rarely separated from², a parietal; first lower labial *not* in contact (unless *humulatus* is a synonym) with its fellow behind the mental; 3 lower labials in contact with the anterior sublinguals, which are as long as, or slightly longer than, the posterior. Midbody scales in 15 rows, smooth; ventrals 131-167; anal entire; subcaudals 34-59³.

Based on original descriptions, literature, data of those in Transvaal Museum, and many Kenya, Tanganyika, Mozambique and Transvaal specimens in the M.C.Z.

¹ On right side only of a Lumbo snake (M.C.Z. 16364).

² On right side only of a Lumbo snake (M.C.Z. 16364).

³ Or 63 if one includes a snake from Ingwavuma, Zululand (T.M. 15315) with 154 ventrals, these counts checked by FitzSimons who has another Zululand specimen (from Ntambanana) with 133 ventrals and 50 subcaudals.

Color. Two principal color phases exist, one, which is intermediate between the uniformly plumbeous, sylvicoline *c. ulugurensis* and the pale brown, savanna and coastlands *c. capensis*, occurs in deforested or adjacent areas and is likely to present so many stages that it is unworthy of recognition by name. The following description is based on a pair, which also happen to be the most northerly examples of *c. capensis* known.

♂ ♀. Mt. Mbololo. Above, head black, a five-scale wide transverse black band edged before and behind by ill-defined scale-wide light bands (which broaden on the sides) on nape; back and tail uniformly iridescent plumbeous or steely blue. Below, throat white, body also but so thoroughly infuscated with gray as to appear dusky.

♂. Mlalo, western Usambara Mtns. Above, as last, but the light bands on nape are broader, sharply distinct, and white (in alcohol); also there is a light spot present at the base of each dorsal scale. Below, similar to the Mbololo snakes.

♂. Lydenburg, Transvaal. Above, head black, a four-scale wide transverse black band edged before by a scale-wide buff band on nape; back and tail pinkish brown or pale brown with a fine brown vertebral line. Below, white. The width of the nuchal band varies from 3 to 6 rows in South African specimens in which the vertebral line may be black, if present, or absent altogether.

Size. Total length of ?♂, 290 (239 + 51) mm. from Lumbo; total length of ?♀, 410 (335 + 75) mm. from Cape Province (Werner, 1898, sex not stated. This is 100 mm. above any other record and may be a misprint).

Remarks. It would appear that after sending the description of *Elapomorphus capensis* to press, Sir A. Smith, realizing the name for his new genus was preoccupied, forwarded the manuscript of *Aparallactus capensis* to his publishers for substitution, for it is inserted under the caption of Sauria! Fortunately it has paragraph priority over the other description.

FitzSimons (1937a), after reexamination, doubts that either of the specimens in the British Museum represent the type, though considered so by Boulenger (1896d).

A. guentheri of Boulenger was a composite of several specimens of *capensis* with divided nasals, which he had, and an example of *bocagii* with a divided nasal mentioned by Bocage, which Boulenger had not seen.

A. punctatolineatus Boulenger was based on another *capensis* mentioned by Bocage which had only 6 upper labials, the second and third

entering the orbit, a condition occurring spasmodically throughout the range of *capensis*. Later Boulenger (1896d) referred a Nyasaland snake to this species.

A. nigriceps of Boulenger was a composite of a specimen of *capensis* with 6 upper labials, etc., and the data derived from Peters' original description of *nigriceps*, which is distinguished from all other *Aparallactus* by its low ventral count (108-123).

The name *capensis* has not been applied to any other species except *bocagii*, which is distinguished by its much higher ventral count (168-191).

Dentition. Bogert (1940) after examination of three snakes from Nyasaland and Transvaal, found that the maxillary teeth ranged from 5 to 7 followed, after a diastema, by 2 enlarged grooved fangs.

Hemipenis. This is discussed at length by Bogert (1940).

Sexual dimorphism. There appears to be a slight overlap in the ventral count of this species for a Lydenburg ♂ in the Museum of Comparative Zoölogy has 148, while Boulenger (1896d) has recorded a ♀ from Zanzibar with that number.

Breeding. On April 27, at Mbanja, a ♀ held 2 eggs measuring 31 x 4 mm.

Dict. At Lumbo, one morning, a *Leptotyphlops longicauda* was captured together with several *Lycophidion semiannulis* and *Aparallactus c. capensis*. They were all put into a cigarette tin until evening when I should have time to attend to them. On opening the tin about 6 p.m. I was disagreeably surprised to find the valuable worm snake missing. As escape was out of the question I held up the other snakes, one by one, against a strong acetylene lamp until I found the worm snake doubled up in the stomach of a Cape black-headed snake.

So run my typescript notes of 25.viii.1918, but in recent years I have often wondered whether I did not make a mistake for a worm snake would be natural prey for a wolf snake, whereas, except for a snail, there is no other record of an *Aparallactus* eating anything else but a centipede. On the other hand see note below.

Temperament. At Lumbo, where I took sixteen of these little snakes, I observed that they bit quite fiercely at times but their tiny teeth failed to break through the skin. A nine-inch female attacked a five and a half inch snake, the latter seized its aggressor so that together they formed a struggling circle. If I had left them alone it seems possible that the larger would have dined off the lesser.

Habitat. This Lumbo series were mostly dug from about the roots of shrubs and grass though some were found on the surface of the

sandy soil in the early morning. Hewitt states that they are to be found in termitaria or beneath stones in open country, while V. Fitz-Simons has taken them beneath stones on granite hills. My Mbololo specimens were taken in a somewhat similar situation on the mountain-side just below the forest edge.

Localities. **Kenya Colony:** Mount Mbololo. **Tanganyika Territory:** Marangu, Kilimanjaro; Mbanja; Mlalo, w. Usambara; Mohorro; Sanya, Kilimanjaro; Tanga; Ujiji. **Zanzibar.** **Mafia Id. Mozambique:** Angoche; Lumbo; Rikatla; Tete. **Nyasaland:** Chiradzulu; Lake Nyasa; Mlanje; Shire Highlands; Zomba. **Southern Rhodesia:** Bulawayo; Gwelo; Salisbury district; Victoria Falls; Vumba Mountain. **Bechuanaland:** Serowe. **Zululand:** Entendweni; Ingwavuma (T.M.); Kosi Bay; Ntambanana (T.M.); Umfolosi Rivers junction. **Transvaal:** Blaauwberg (T.M.); De Kaap Goldfield; Delmas Road near Pretoria; Irene; Johannesburg (T.M.); Klein Letaba (T.M.); Kraalkop; Krabbe-fontein; Legogot; Lydenburg district; Modderfontein; Mphome; Nelspruit (T.M.); Punda Maria (T.M.); Rustenberg (T.M.); Selati; Shilowane; Woodbush (T.M.); Zeekoegat. **Orange Free State.** **Cape Province:** Burghersdorp; East London; Pondoland; Zingqolo. **Angola:** Quindumbo.

Range. Southeast Kenya Colony south to Cape Province.

APARALLACTUS CAPENSIS ULUGURUENSIS Barbour & Loveridge

- 1928c. *Aparallactus uluguruensis* Barbour & Loveridge, Mem. Mus. Comp. Zool., 50, p. 132: Nyange, Uluguru Mountains, Tanganyika Territory.
 1936j. Loveridge, p. 270. *
 1937f. Loveridge, pp. 493, 502.
 1942e *Aparallactus capensis uluguruensis* Loveridge, p. 301.

Name. Uluguru Centipede-eater (English); *penge* (Pokomo).

Description. Rostral nearly twice, or twice, as broad as deep, the portion visible from above one third to two thirds as long as its distance from the frontal; nostril in an entire, semidivided, or divided nasal; internasals shorter than, or much shorter than, the prefrontals; frontal once and a half to once and two thirds as long as broad (in the middle), much longer than its distance from the end of the snout, shorter than the parietals, once and two thirds to twice as broad as a supraocular; no loreal; preocular 1, in contact with the nasal; eye

small, its diameter equal to, or greater than, its distance from the mouth; postocular 1, very rarely 2¹, not in contact with the anterior temporal; temporals 1 + 1, rarely 1 + 2²; upper labials 7, rarely 6³, the third and fourth, rarely second and third³, entering the orbit, fifth largest and in contact with a parietal; first lower labial not in contact with its fellow behind the mental; 3 lower labials in contact with the anterior sublinguals, which are as long as, or slightly longer than, the posterior. Midbody scales in 15 rows, smooth; ventrals 137-159; anal entire; subcaudals 43-53⁴.

Based on the fourteen known specimens.

Color. Above, uniformly plumbeous or iridescent black. Below, as above or somewhat paler, more particularly on throat and tail which may be almost white. Young of 182 mm. are colored precisely like the adults.

Size. Total length of paratype ♂ (M.C.Z. 23366), 400 (320 + 80) mm. from Amani; total length of paratype ♀ (M.C.Z. 23364), 387 (333 + 54) mm. from Nyange.

Sexual dimorphism. ♂♂ have 137-144 ventrals, and 43-52 subcaudals. ♀♀ have 158-159 ventrals, and 44-51 subcaudals.

Breeding. At Ngatana, on June 17, a ♀ held 2 eggs, each measuring 12 x 5 mm. Four adult ♀♀ taken in the Uluguru and Usambara Mountains in October, November and December, were not breeding.

Diet. Six centipedes (*Alipes grandidieri* and another species) were recovered from the type series. A snail as well as two centipedes were present in the stomach of a Nyange snake. A seventh centipede in a Magrotto specimen.

Habitat. Beneath logs in montane rain forest and gallery forest.

Localities. **Kenya Colony:** Ngatana, Tana River. **Tanganyika Territory:** Amani, Usambara Mountains; Magrotto Estate, Magrotto Mountain; Nyange, Uluguru Mountains.

Range. Virgin forest in coastal belt of Kenya Colony and Tanganyika Territory.

¹ On left side only of M.C.Z. 23369.

² On left side only of an Amani paratype, right side of a Nyange paratype.

³ On right side only of an Amani paratype.

⁴ 58 was a misprint.

APARALLACTUS NIGRICEPS (Peters)

1854. *Uriechis nigriceps* Peters, Monatsb. Akad. Wiss. Berlin, p. 623: Tete, Mozambique.
 1855. Peters, p. 52.
 1859?. Bianconi, p. 385.
 1882a. Peters, p. 111, pl. xviii, figs. 1-1e.
 1884a. Rochebrune, p. 154 (ignored).
 1896a. Bocage, p. 100.
 1857. *Eucritus atrocephalus* Jan, 1857, Cenni Museo Civico Milano, p. 44: Inhambane, Mozambique (*non vidi*).
 1862. *Uriechis atriceps* Jan, p. 49 (lapsus for *nigriceps*).
 1866. Jan, livr. 15, pl. i, fig. 4.
 1895h. *Aparallactus nigriceps* Boulenger (part), p. 173.
 1896d. Boulenger (part), p. 260 (no material).

Further citation of '*nigriceps*' will be found under *c. bocagii*.

Description. Rostral nearly twice as broad as deep, the portion visible from above one third to two thirds as long as its distance from the frontal; nostril in an entire nasal; internasals shorter than the prefrontals; frontal once and a half as long as broad (in the middle), much longer than its distance from the end of the snout, as long as, or slightly shorter than, the parietals; twice as broad as a supraocular; no loreal; preocular 1, in contact with, rarely separated from, the nasal; eye small, its diameter equal to, or greater than, its distance from the mouth; postocular 1, not in contact with the anterior temporal; temporals 1 + 1; upper labials 6, the second and third entering the orbit, fourth largest, fourth, or fourth and fifth, in contact with a parietal; first lower labial not in contact with its fellow behind the mental; 3 lower labials in contact with the anterior sublinguals, which are as long as, or slightly longer than, the posterior. Midbody scales in 15 rows, smooth; ventrals 108-123; anal entire; subcaudals 20-35.

Based on original descriptions and figures.

Color. Above, head black with white blotches, one anterior, one posterior, to the eye, black of crown continues on to nape where it is edged posteriorly with a yellow band; back and tail uniformly reddish olive brown except for the trace of a fine black vertebral line. Below, pale yellow.

Size. Total length of type, 225 (180 + 45) mm.

Sexual dimorphism. ?

Localities. **Mozambique:** Inhambane; Tete.

Range. Mozambique (known only from the type, and Bianconi's specimens in Milan Museum).

Genus ELAPSOIDEA

1866a. *Elapsoidea* Bocage, Journ. Sci. Lisboa, **1**, pp. 50, 70 (type *güntherii* Bocage).

1896d. *Elapechis* Boulenger, Cat. Snakes Brit. Mus., **3**, p. 358, footnote (substitute name).

Maxillary bone extending forwards as far as the palatine, with a pair of large grooved poison-fangs followed by 2-4 small teeth; anterior mandibular teeth longest. Head moderate, not or but slightly distinct from neck; eye small, with round pupil; nasal divided; loreal absent¹; a single preocular. Body cylindrical; scales oblique, smooth, without pits, in 13² rows; ventrals rounded. Tail very short; subcaudals all or most in two rows.

Range. Africa south of 15° N., i.e. Senegal; Kordofan; Ethiopia.

Remarks. The substitute name *Elapechis* was proposed by Boulenger on the grounds that the correct form of *Elapsoidea* should be *Elapoidea*, which he considered preoccupied by *Elapoides* Boie, 1827, of Java.

In 1936 I invited attention to the fact that *güntherii* and *nigra* from the equatorial region, exhibit a higher ventral count than was the case with Angolan snakes being referred to *güntherii*. As no one investigated the subject I have attempted to straighten out the somewhat involved situation myself, though lacking material of the form *laticincta* occurring to the north of the thousand-mile-wide equatorial belt. All the remaining five forms are represented in the collections of the Museum of Comparative Zoölogy, which has 73 snakes of this genus, from which I exclude *multifasciata* and its synonym *duttoni*.

Thus we find ourselves left with a monotypic genus, and it has been no easy task to find characters wherewith to separate the various forms and, indeed, I have not attempted to do so in the case of *laticincta* (as opposed to *decosteri*) on account of the lack of material.

To judge by our single example of typical *sundevallii*, that race has an obtusely pointed snout. In this connection, however, it is important to note that Boulenger (1896d) had no material of typical *sundevallii* when he published his key to the 'species' of the genus. Later

¹ A small loreal-like scale appears in 1 of the 77 snakes examined.

² Boettger's statement that *boulengeri* had 15 was incorrect; *multifasciata* with 15-17 is not an *Elapsoidea* but a cobra.

(1897d) he obtained "several" and in his revised (1910b) key he dropped this character of snout shape which formerly had been treated as if of major importance. Was this because it broke down in series of even *sundevallii*? The snout is most definitely pointed in an adult ♀ *decosteri* (from Lumbo), less noticeably so in a young ♀ of the same form from Pretoria, or an adult ♀ *güntherii* from northern Kenya (Guaso Nyiro). The thought occurred that it might be a sexual difference, but it was found to be rounded in adult and juvenile ♀♀ of *güntherii* from western Kenya (Kaimosi and Loita Plains) just as much as in adult and juvenile ♂♂ of *semiammulata* from Angola or juvenile *decosteri* from Northern Rhodesia. I am inclined to the conclusion that it is an adaptation to environment, being rounded in specimens of *güntherii* and *nigra* living in the equatorial rain-forests where they have to burrow only in soft leaf mould, more often pointed in those snakes (*decosteri*, *fitzsimonsi* and *güntherii*) which live under savanna conditions. In practice one finds so many intermediate conditions between "obtusely pointed" and "rounded" that I could not utilize it as a key character.

The portion of the rostral visible from above is certainly greater in typical *sundevallii* and *fitzsimonsi* than in other forms with the exception of *decosteri* which would appear to link it with the more northern races.

The length of the internasals in relation to that of the prefrontals is a useless character, this also applies to frontal length in relation to its width, or to the length of the parietals, or to its distance from the end of the snout. I imagine that the relative lengths of the anterior and posterior sublinguals will probably be found to vary to much the same extent in *all* the races as soon as adequate series, such as have been available to me in the case of *güntherii* and *nigra*, have been studied.

Nevertheless, despite the fact that I regard almost all the matter furnished under the head of *Description* as practically valueless, I have included it as showing the carefully ascertained range of variation within the limits of each race as here defined. Such data having been obtained from the literature listed in the synonymy, together with the results of an examination of all the material at my disposal.

Under the heading *Localities*, the letter *T* after a locality signifies that scale counts of one or more specimens in the Transvaal Museum have been supplied me; the letters M.C.Z. in parentheses are placed only after such localities as have not yet appeared in the literature, and are to indicate that the specimen on which the record is based is in the collection of the Museum of Comparative Zoölogy.

Key to the Races¹

1. Ventrals less than 169.....	2
Ventrals 162-184.....	7
2. Ventrals 138-169; subcaudals 13-27.....	3
Ventrals 151-166; subcaudals 13-30.....	6
3. Young with light crossbars about half the width of, or at least much narrower than, the interspaces between them; adults uniformly black.....	4
Young with light crossbars subequal in width to the interspaces between them; adults black or brown with 14-22 <i>pairs</i> of well-defined white crossbars (formed by division of the solid bars of the young).....	5
4. Range: Southern Ethiopia and Kordofan west through extreme northern Belgian Congo (Uelle) to northern Cameroons.....	<i>s. laticincta</i> (p. 216)
Range: Mozambique, Nyasaland, and Northern Rhodesia south through Transvaal to Zululand and Orange Free State.....	<i>s. decosteri</i> (p. 217)
5. Range: Southern Belgian Congo and Angola.....	<i>s. semiannulata</i> (p. 220)
6. Subcaudals in males 23-30, in females 18-21; range: Kenya and northern Tanganyika Territory (Oldeani; Kilimanjaro) west through Uganda and Belgian Congo to Senegal.....	<i>s. g�ntherii</i> (p. 222)
Subcaudals in males 18-24, in females 13-17; range: eastern Tanganyika Territory (Magrotto, Usambara, and Uluguru Mountains).....	<i>s. nigra</i> (p. 225)
7. Adults and young slaty gray tinged with purplish brown with numerous white- or yellow-edged, black crossbars; range: Natal.....	<i>s. sundevallii</i> (p. 228)
Adults uniformly purplish brown above, young barred as in the typical form; range: eastern Cape Province (Kimberly) west through Bechuanaland to South West Africa.....	<i>s. fitzsimonsi</i> (p. 229)

¹ Obviously unsatisfactory in some respects due to the lack of material representing *laticincta* and paucity for the two following forms; under the circumstances it has seemed best to give only the range rather than cite differences which may not prove to be constant.

STATISTICAL SYNOPSIS OF VARIATION IN THE RACES OF ELAPSOIDEA

Race	Ventrals	Subcaudals	Upper labials (entering orbit)	Lower labials in contact with anterior sublinguals	Preocular	Postoculars	Temporals	Posterior nasal in contact (c) with preocular	Maximum length	
									Head and Body	Tail
<i>s. laticincta</i>	143-150	13-24	7 (3-4)*	3-3	1	2	1+2	C	430	28
<i>s. decosteri</i>	138-169	13-26	7 (3-4)	3-4	1	2	1+2*	C*	650	65
<i>s. semiannulata</i>	139-153	15-27	7 (3-4)	3-4	1	2	1+2	C	438	37
<i>s. guntherii</i>	151-166	18-30	7 (3-4)	3-4	1	2	1+2	C*	581	49
<i>s. nigra</i>	151-162	13-24	7 (3-4)*	3-4	1	2*	1+2*	C	548	37
<i>s. sundevallii</i>	163-184	19-27	7 (3-4)	3-4	1	2	1+2*	C*	825	55
<i>s. filzsimonsi</i>	162-181	17-23	7 (3-4)	3-4	1	2	1+2	C	766	50

* See text for rare variation involving one side of one snake.

ELAPSOIDEA SUNDEVALLI LATICINCTA (Werner)

1917. *Elaepechis guentheri* Sternfeld (not Bocage), p. 481.
 1939c. Scorteccei, p. 183, figs. 101-102.
 1940a. Scorteccei, p. 136, figs. 1-2.
 1919. *Elaepechis laticinctus* Werner, Denks. Akad. Wiss. Wien, 96, p. 507,
 fig. 8: Kadugli, Kordofan, Anglo-Egyptian Sudan.
 1923a. Werner, p. 179.

Description. Snout obtusely pointed; portion of rostral visible from above measuring half its distance from the frontal; internasals half the length of the prefrontals; frontal once and a third to once and a half as long as broad, as long as its distance from the end of the snout, two-thirds the length of the parietals; upper labials rarely 6, the second and third entering orbit (on right side of Filu snake); anterior sublinguals slightly longer than the posterior.

For character common to all forms see p. 213; for scale counts see statistical table above.

Color. Young. Above, a goblet-shaped (Uelle specimen) prolongation of, or a black line from, the black nuchal crossbar extends over parietal suture, otherwise head grayish; body barred alternately black (about 8-10 scales wide) and gray (about 5 scales wide), the dark bars being about twice as broad as the light interspaces, which apparently number 14 on body, 2 on tail. Below, whitish.

Adult from Poli. Above, head and body uniformly black. Below, whitish.

Size. Total length of a supposed ♂ (with 24 subcaudals), 228 (203 + 25) mm. from Filtu (Scortecchi), or a supposed ♀ (with 17 subcaudals), 458 (430 + 28) mm. from Poli (Loveridge), of juvenile type, supposedly a ♀ (with 13 subcaudals), 237 (220 + 17) mm.

Remarks. The above description, as well as data furnished in statistical table and key, is based on the information contained in the above citations together with the data derived from a large example from Poli, Garua, northern British Cameroons, submitted to me many years ago by the Vienna Museum. This is the only member of the northern form which I have seen and whether I am correct in lumping all together under the name *laticincta* remains to be seen. With inadequate material I have been unable to separate it from the southeastern race *decosteri*, to which Werner himself stated that it was related, allegedly differing from *güntherii* by its obtusely pointed snout. Remarks on the latter character will be found under the genus.

Diet. A skink (*Mabuya perroteti mongallensis*) in stomach of type.

Localities. **Ethiopia:** Filtu. **Anglo-Egyptian Sudan:** Kadugli. **Belgian Congo:** Angu, Uelle. **British Cameroons:** Poli near Garua. (Possibly some other northern Congo references to *güntherii* for which no scale-counts are given, and almost certainly the northern Nigerian record of Boulenger, repeated by Angel, are referable to *laticincta*).

Range. Southern Ethiopia and Kordofan west through northern Belgian Congo (Uelle) to northern Cameroons (and possibly northern Nigeria).

ELAPSOIDEA SUNDEVALLII DECOSTERI Boulenger

- 1888d. *Elapsoidea Decosteri* Boulenger, Ann. Mag. Nat. Hist. (6), 2, p. 141: Delagoa Bay, Mozambique.
- 1895. *Elapsoidea Boulengeri* Boettger, Zoo. Anz., 18, p. 62: Boroma, Zambesi, Mozambique.
- 1922a. Mertens, p. 182.
- 1937b. Mertens, p. 14.
- 1895. *Elapsoidea Guentheri* Günther (part, not of Bocage), p. 525 (Nyasaland only).
- 1934. Pitman, p. 298.
- 1937. Pitman (part), p. 346 (N. Rhodesia references).
- 1896. *Elapechis sundevali* Peracca (not Smith), p. 4.
- 1896d. *Elapechis guentheri* Boulenger (part), p. 359 (Nyasaland only).

- 1896. Peracca, p. 4.
- 1908. Gough, p. 33.
- 1909a. Chubb, p. 596.
- 1910b. Boulenger (part), p. 519 (Transvaal).
- 1912. FitzSimons, F. W. (part), pp. 166, 167.
- 1913. Hewitt & Power, p. 165.
- 1921a. Angel, p. 44.
- 1896d. *Elapechis decosteri* Boulenger, p. 360.
- 1898. Slater, p. 101.
- 1908b. Boulenger, p. 230.
- 1910b. Boulenger, p. 519.
- 1912. FitzSimons, F. W., pp. 166, 168.
- 1923a. Werner, p. 179.
- 1896d. *Elapechis boulengeri* Boulenger, p. 361.
- 1898. Boettger, p. 119.
- 1915c. Boulenger, p. 635.
- 1923a. Werner, p. 179.
- 1907a. *Elapechis niger* Boulenger (not Günther), p. 12.
- 1908c. Sternfeld, p. 247.
- 1912. Peracca, p. 6.
- 1923c. Loveridge (part), p. 890 (Lumbo only).
- 1934. *Elapsoidea (Elapechis) niger* Pitman, p. 298.
- 1908. *Elapechis sunderalli* Gough (part, not Smith), p. 34 (Orange River Colony).

Sternfeld's (1910b, 1910c) reference to *decoasteri* is tentatively referred to *s. fitzsimonsi* subsp. nov.

Native name. Kouseband slang (Afrikaans: F. W. FitzSimons).

Description. Snout rounded or obtusely pointed; portion of rostral visible from above measuring half to three-quarters its distance from the frontal; half to three-quarters the length of the prefrontals; frontal once and a third to once and a half as long as broad, as long as, or longer than, its distance from the end of the snout, much shorter than, or two-thirds the length of the parietals; posterior nasal rarely separated from the single preocular, temporals only rarely 2 + 2; anterior sublinguals slightly shorter than, subequal to, or slightly longer than the posterior.

For characters common to all forms see p. 213; for scale counts see statistical table on p. 216.

Color. Young. Above, a goblet-shaped prolongation of the dark nuchal crossbar extends over parietal suture on to frontal, sides of head with dusky markings, otherwise head white or grayish; body barred alternately with chocolate brown (or black) and pale buff (or

white), the dark bars being much broader than the light interspaces which number 10-25 (normally 15-20) on body, 2-3 (rarely 4) on tail.

Adult. Above, head and body glossy black (fading to purplish brown in alcohol), or dark gray with each scale edged with black, uniform, or the outer row of scales whitish and sometimes with a trace of narrow white crossbars. Below, whitish or grayish.

Size. Total length of an unsexed specimen (Transvaal Mus. 16800), 715 (650 + 65) mm., from Manaba; of a gravid ♀ (M.C.Z. 18233), 500 (468 + 32) mm. from Lumbo; type of *decosteri* (S. Afr. Mus.), 450 (400 + 50) mm.; of juvenile type of *boulengeri* (Senck. Mus.), 170 (156 + 14) mm.

Remarks. *E. decosteri* was based on an unsexed snake which, to judge by its 25 subcaudals, is probably a male, for the same reason the smaller snake with 26 subcaudals allegedly a ♀ (Boulenger, 1896d) is likely to be a male also. *E. boulengeri*, based on a juvenile with consequently different color pattern to the old *decosteri*, was said to differ by the possession of 15 midbody scale-rows, however Mertens (1937b), on reexamination of the type found that there are but 13. I therefore refer it to the synonymy of *decosteri*.

Peracca's (1896) records of both *sunderalli* and *güntheri* from Kazungula, S. R., here referred to *decosteri* may possibly be *fitzsimonsi*.

Breeding. On January 19, at Broken Hill, a ♀ held 10 large and elongate eggs (Pitman). On July 11, at Lumbo, a ♀ held 4 eggs, the largest measuring 17 x 7 mm.

Habitat. Two were dug from a termite hill in dry savanna bush at Lumbo, altitude *circa* 100 feet (A. L.).

Localities. **Mozambique:** Boroma; Zambesi; Chimbo (Tschimbo); Delagoa Bay; Lourenco Marques^T; Lumbo. **Nyasaland:** Shire Highlands. **Northern Rhodesia:** Broken Hill to Bwana Mkubwa Mine; Lealui; Mbala, east Loangwa District. **Southern Rhodesia:** Bulawayo; Deka^T, 50 miles south of Victoria Falls; Eldorado; Gatooma^T; Kazungula; Wankie. **Transvaal:** Ermelo^T; Lydenburg District^T, Messina^T; Middleburg^T; Piet Retief^T; Pilgrims' Rest^T; Pretoria (M.C.Z.); Sabie^T; Swaziland^T; Waterberg^T; Waterpoort^T; White River^T. **Zululand:** Kosi Bay; Manaba^T; Maputa^T. **Orange Free State.** (Transvaal Mus. specimen listed by Gough as *sunderalli*, but has only 152 ventrals).

Range. Zululand and Transvaal north to Mozambique and the Rhodesias. It is possible that this race extends north of the Rovuma

^T Transvaal Museum specimens, not seen, but the data for which has been kindly supplied by Mr. F. W. FitzSimons.

River into southeastern Tanganyika Territory for Mr. R. de la B. Barker writes me (1.vi.41) that at Lindi he had found a snake, seven inches in length, with 14 white crossbars. On the other hand it may be a young *nigra* of brighter coloration at sea level than is usual in its forested montane habitat.

ELAPSOIDEA SUNDEVALLII SEMIANNULATA Bocage

- 1873b. *Elapsoidea Güntherii* Bocage (not Bocage of 1866), p. 224.
- 1888a. Boettger (part), p. 82 (omit range).
- 1895a. Bocage (part), p. 129, pl. xiv, figs. 3a-c.
- 1896a. Bocage (part), p. 79 (Angola record only).
- 1897a. Bocage (part), p. 202 (Angola records only).
- 1933. Schmidt, p. 14.
- 1936h. Loveridge (part), p. 41 (Caconda only).
- 1937b. Mertens, p. 14.
- 1938e. Mertens, p. 442.
- 1940. Bogert, p. 86.
- 1882b. *Elapsoidea semi-annulata* Bocage, Journ. Sci. Lisboa, 8, p. 303: Caconda, Angola.
- 1887c. *Elapsoidea Hessci* Boettger, Zool. Anz, 10, p. 650: Povo Netonna, Banana, Belgian Congo.
- 1888a. Boettger, p. 83, pl. ii, figs. 6a-e.
- 1922a. Mertens, p. 182.
- 1896d. *Elapechis hessii* Boulenger, p. 360.
- 1915a. Boulenger, p. 218.
- 1898. Boettger, p. 118.
- 1920a. Witte, p. 62.
- 1920b. Witte, p. 275.
- 1923a. Werner, p. 179.
- 1898. *Elapechis guentheri* Boettger (not Bocage), p. 118.
- 1937b. Monard, pp. 136, 137 (but omit range).
- 1900. *Elapsoidea güntheri* var *semiannulata* Ferreira, p. 52.

Description. Snout rounded or obtusely pointed; portion of rostral visible from above measuring a third or half its distance from the frontal; internasals two-thirds or three-quarters the length of the prefrontals; frontal once and a half as long as broad, longer than its distance from the end of the snout, slightly shorter than the parietals; rarely a small azygous scale between frontal and parietals¹; anterior sublinguals separated from the mental except in the aberrant type of

¹ In a specimen from Povo Nemlao (Boettger).

hessei in which they were extensively in contact with the mental, subequal to, or slightly longer than, the posterior.

For characters common to all forms see p. 213; for scale counts see statistical table on p. 216.

Color. Young Topotype. Above, the apex of a \wedge -shaped prolongation of the black nuchal crossbar extends over parietal suture to the frontal; a black circumorbital ring present or absent; loreal region and sides of head with dusky markings, otherwise head white; body barred alternately chocolate brown and white, the dark bars being subequal in width to the light interspaces, whose edges are even whiter, 15 (equal to 15 pairs in adult) white bars on body, 3 on tail. Below, throat white, rest whitish with dusky mottling especially along the edges of the scales.

Adult. Above, snout and sides of head olive, but lower portion of upper labials white, otherwise head and body black, grayish black, or light brown, the edges of some scales tipped with pure white to form narrow crossbars, of which there are from 14–22 *pairs* on body, 2–3 on tail. Below, whitish or yellowish, uniform, or with dusky mottlings accentuated on the edges of the scales.

Size. Total length of ♂ (A.M.N.H. 51837), 475 (438 + 37) mm. from ? Hanha, of ♀ (C.M. 5914), 337 (296 + 41) mm. from Chitau.

Anatomy. Bogert (1940) has described the hemipenis of an Angolan *semiannulata* as follows: "Extends to the eleventh caudal, bifurcating at the ninth. Sulcus bifurcates at the seventh caudal. Basal portion with small spines, a row of enlarged spines increasing in size distally on either side of the sulcus with smaller spines in the intervening space. On the side opposite the sulcus, a pair of enlarged spines is present in the region of the sixth caudal. Each fork is armed with small spines in longitudinal rows."

Diet. Two hymenopterous larvae in a Katanga snake (Mertens).

Localities. **Angola:** Caconda; Cazengo; Chitau; Cubal; Dondi, near Bella Vista (M.C.Z.); Galangue (Galanga); Gambos, Mossamedes; Kalukembe; Kampulu; Maconjo. **Belgian Congo:** (southern frontier): Dilolo to Muciacia; Povo Nemlao; Povo Netonna.

Range. Angola and southern Belgian Congo.

ELAPSOIDEA SUNDEVALLII GÜNTHERII Bocage

- 1866a. *Elapsoidea Güntherii* Bocage, Journ. Sci. Lisboa, 1, pp. 50, 70, pl. i, figs. 3-3b: Cabinda, Portuguese Congo and Bissao, Portuguese Guinea.
- 1866b. Bocage, p. 70.
- 1884a. Rochebrune, p. 192 (ignored).
- 1884b. Sauvage, p. 201.
- 1895a. Bocage (part), p. 129 (exclude Angola).
1895. Günther (part), p. 525 (exclude Nyasaland).
1896. Tornier (part), p. 84 (exclude eastern Tanganyika).
- 1936h. Loveridge (part), p. 41 (exclude Angola).
- 1936j. Loveridge, p. 271.
- 1937c. Loveridge, p. 278.
- 1937d. Mertens, p. 9.
1937. Pitman (part), p. 346, pl. xiii, fig. 1, pl. N, fig. 3.
1937. Uthmöller, p. 123.
- 1938a. Pitman, pp. 218, 233.
- 1938b. Pitman, pp. 40, 81, 199, 257, 316, 331 (reprint with plates).
1938. Uthmöller, p. 46.
- 1942e. Loveridge (part), p. 302 (exclude Magrotto).
- 1896d. *Elapechis guentheri* Boulenger (part), p. 359 (exclude Shire).
- 1896b. Mocquard, p. 45.
- 1897b. Boulenger, p. 280.
1897. Tornier, p. 65.
- 1900b. Boulenger, p. 455.
- 1902a. Boulenger, p. 447.
- 1906i. Boulenger, p. 215.
1907. Lönnberg, p. 16.
- 1908b. Sternfeld, pp. 220, 234.
- 1909a. Sternfeld, p. 23.
- 1910b. Boulenger (part), p. 519 (exclude Transvaal).
1910. Meek, p. 405.
- 1910a. Sternfeld (part), p. 37 (exclude eastern Tanganyika).
- 1911c. Boulenger, p. 167.
- 1915a. Boulenger (part), p. 218 (exclude Angola & Nyasaland).
- 1915c. Boulenger (part), p. 635 (exclude Angola & Nyasaland).
- 1916a. Loveridge, p. 86.
- 1916b. Loveridge, pp. 117, 120.
1917. Chabanaud, p. 381.
- 1917b. Chabanaud, p. 13.
- 1918a. Loveridge, p. 324.
- 1919b. Boulenger (part), p. 294 (exclude Angola & Nyasaland).
- 1920a. Witte, p. 62.
- 1920b. Witte (part), p. 274 (exclude Angola & Nyasaland).

- 1922c. Angel, p. 357.
- 1923e. Loveridge, p. 889.
- 1923a. Werner (part), p. 179 (exclude Angola & Nyasaland).
- 1924b. Loveridge, p. 7.
- 1933f. Angel (part), p. 185, figs. 69-69c (exclude Angola etc.).
- 1933m. Witte, p. 96.
- 1897b. *Elapechis moebiusi* Werner, Verh. Zool.-Bot. Ges. Wien, 47, p. 400:
Kete, Togoland.
- 1910a. *Elapechis niger* Sternfeld (part, not Günther), p. 37.
- 1920a. Witte, p. 62.
- 1920b. Witte, p. 275.
- 1923e. Loveridge (part), p. 890 (exclude Lumbo, Mozambique).
- 1934a. *Elapechis* sp. Schwetz, p. 381.

Among the above citations will be found those with or without the final 'i', others with the 'ü' or 'ue' rendering, it has not been thought necessary to indicate such minor deviations. Further citations of '*güntheri*' will be found under *s. nigra*, *s. semiannulata*, *s. deoesteri* and *s. laticincta*.

Native name. *Mugoya* (Gishu), a name which is applied to any *Typhlops* or *Leptotyphlops* in Ganda or Soga, *vide* Pitman.

Description. Snout rounded; portion of rostral visible from above measuring a third to half its distance from the frontal; internasals two-thirds to three-quarters the length of the prefrontals; frontal once and a quarter to once and a half as long as broad, as long as, or longer than, its distance from the end of the snout, slightly shorter than, rarely equal to, the length of the parietals; posterior nasal rarely separated from the single preocular; anterior sublinguals slightly shorter than the posterior.

For characters common to all forms see p. 213; for scale counts see statistical table on p. 216.

Color. Young, ex. Kenya. Above, head as well as body, dark, the white crossbars or bands broader than in adults, where each white bar has split to form a pair.

Adult. Above, head and body plumbeous gray, brown, or black, uniform, or the edges of some scales tipped with white to form transverse series of white dots arranged in broad or narrow crossbars of which there are some 15 to 33 pairs on body and 3 to 5 on tail. Below, yellowish or whitish, each scale lightly edged with dusky, or grayish, brownish, or black, the gular region usually lighter.

Whether snakes from Kenya (east of Kaimosi, Elgon and the Burnt Forest) are separable by color remains to be demonstrated. The half-

dozen Nairobi specimens which I captured had coral pink or red centres to the white crossbars separating the black interspaces. Whether such is the case with snakes from the Guaso Nyiro, Njoro, and Loita Plains is not known. Pitman records the eyes of two Bukalasa snakes as being black with invisible pupil, and translucent with silver pupil respectively.

Size. Total length of ♂ (M.C.Z. 40721), 630 (581 + 49) mm., and of ♀ (Mich. Mus.), 627 (583 + 44) mm., both from Kaimosi. The former was erroneously cited as a ♀ in a previous paper.

Remarks. The type of *moebiusi*, measuring 442 (412 + 30) mm., was dark brown above and light yellow below. Its author acquiesced in Boulenger's action in referring it to the synonymy of *güntherii*.

Snakes from northern Tanganyika Territory recorded by Mertens and Uthmüller are somewhat intermediate, agreeing more closely with *güntherii* than with *nigra*, however.

Angel (1922c) records an aberrant individual from Clermont House, Nairobi, in which the rostral, internasals, first and second upper labials are irregularly broken up into small scales; the posterior nasal is in contact with the preocular on one side, separated on the other; the supraocular is divided on the right side only.

Loveridge (1936j) was in error in giving temporals as 1 + 3 and ventrals 167, the former was a misprint for 1 + 2, the latter a miscount for 166.

Breeding. On September 10, at Kaiso, small eggs present in ovary (Pitman).

Diet. Four lizard eggs, each measuring 8 x 4 mm., were found in the stomach of a Nairobi snake.

Defence. Black specimens, apparently uniformly so, by sudden inflation of the lungs bring into prominence the previously concealed white-tipped bases of certain scales, thus producing an annulate effect which is quite startling.

Temperament. Naturally peaceable and inoffensive, biting only upon real provocation. In Parklands Forest Reserve I nearly trod on one which was sluggishly making its way through the sparse herbage which had sprung up with the advent of the rains.

Habitat. Sea level to 7000 feet. Pitman found a specimen in a recently-planted cotton patch on the Kaiso plain, usually, however, this somewhat secretive species is encountered on, or at the edge of, forest. The Burnt Forest record is based on a snake which was crossing the road at dusk, I held it down with my cycle pump, examined, then released it.

Localities. **Uganda:** Budongo Forest; Bukalasa, 30 miles north of Kampala; Bussu; Kabanda; Kagera River mouth; Kaiso-Tonya Plain on east shore of Lake Albert; Kaliro in Busoga (A.M.N.H.); Mabira Forest; Ruwenzori — foot of; Serere, Teso; Sese Ids.; Sipi, Mt. Elgon. **Kenya Colony:** Burnt Forest; Guaso Nyiro (M.C.Z.); Kaimosi; Kajiado; Kakamega; Kijabe; Loita Plains (M.C.Z.); Nairobi; Njoro; Parklands, Nairobi. **Tanganyika Territory** (northern and western): Kagera (as Kagehi); Kibonoto; Oldeani; Sanya. **Portuguese Congo:** Cabinda. **Belgian Congo:** Dramba; Kunungu; Mahagi Port; Stanley Pool; Stanleyville; Yakoma. **French Equatorial Africa:** Fort Sibut; Kuango River. **Nigeria.** Dahomey: Agouagou. **Gold Coast.** **Togo:** Kete; Mangu; Misahöhe. **Portuguese Guinea:** Bissau; Rio Cas-sine. **Senegambia:** Guidimaka.

Range. Northern Tanganyika Territory and Kenya Colony west to Senegal.

ELAPSOIDEA SUNDEVALLII NIGRA Günther

- 1888b. *Elapsoidea nigra* Günther, Ann. Mag. Nat. Hist. (6), 1, p. 322:
"Ushambola" i.e. Usambara Mountains, Tanganyika Territory.
- 1895b. Werner, p. 193.
1896. Tornier, p. 84.
- 1928e. Loveridge, p. 117.
- 1896d. *Elapechis niger* Boulenger, p. 359, pl. xx, fig. 1.
1897. Tornier, p. 65.
- 1910a. Sternfeld (part), p. 37, fig. 43 (Nguelo and Tanga only).
- 1915a. Boulenger (part), p. 218 (omit Congo and Northern Rhodesia).
- 1915c. Boulenger (part), p. 635 (omit Congo and Northern Rhodesia).
1920. Aders, p. 338.
- 1923a. Werner (part), p. 179 (omit Congo and Northern Rhodesia).
- 1924b. Loveridge (part), p. 7 (omit Kenya Colony and Zanzibar).
1940. Parker, Moreau & Pakenham, pp. 310, 313.
1896. *Elapsoidea güntherii* Tornier (part), p. 84 (Bulwa, Magila, Tanga).
- 1928c. Barbour & Loveridge, p. 134.
- 1937f. Loveridge, p. 502.
- 1942e. Loveridge (part), p. 302 (Magrotto only).
- 1910a. *Elapechis Guentheri* Sternfeld (part), p. 37 (Bulwa, Magila, Tanga).
- 1911b. Nieden, p. 442.

Further citations of "nigra" or "niger" will be found under *s. güntherii* and *s. decosteri*.

Native name. *Kifutu* (Sambara).

Description. Snout rounded; portion of rostral visible from above measuring a quarter to a third its distance from the frontal; internasals rarely half, usually two-thirds to three quarters, rarely equal to, the length of the prefrontals; frontal once and an eighth to once and a half as long as broad, rarely as long as, more usually longer than, its distance from the end of the snout, slightly shorter than, or two thirds the length of the parietals; postoculars only rarely 1; temporals only rarely $1 + 1$; anterior sublinguals subequal to, or slightly longer than, the posterior.

For characters common to all forms see p. 213; for scale counts see statistical table on p. 216.

Other aberrations noted are: a small azygous scale between prefrontals and frontal in M.C.Z. 23411, and topotypes 23424, 23435; a minute loreal present in topotype M.C.Z. 23427; the specimen (M.C.Z. 23413) with a single postocular has it on the left side only; a small azygous scale is present between lower postocular and temporal on both sides of M.C.Z. 23424, 23427, 23435, and on right side only of 23441.

Color. Young. Above, the apex of a Λ -shaped prolongation of the nuchal crossbar extends over parietal suture, otherwise head white or brownish above; body gray with about a score of black crossbars narrowly edged with white, the dark bars being subequal in width to the gray interspaces; tail uniformly black. It will be observed that the light transverse bars of the young progressively disappear with age, from the tail forwards, to produce the uniformly black adults. Below, whitish anteriorly, grayish posteriorly.

Adult. Above, head and body glossy iridescent black, uniform or the edges of some scales tipped with white to form transverse series of white dots or narrow crossbars, of which there may be some 18-24 pairs on the body. Below, usually uniformly black, paler or even white upon the throat, very rarely a few white patches in the middle of the ventrals.

Size. Total length of ♂ (M.C.Z. 48448), 585 (548 + 37) mm. from Magrotto, of ♀ (M.C.Z. 23455), 494 (460 + 34) mm. from Bumbuli, of type ♀ (Brit. Mus.), 420 (390 + 30) mm. A 569 mm. specimen, listed by me as ♀, proves on reëxamination to be a ♂.

Remarks. Sternfeld's (1910a) statement that the anal is divided was just a slip.

Breeding. On October 1, at Nyange, a ♀ held 2 eggs measuring 40 x 10 mm. On November 29-30, at Amani, four ♀ ♀ held 2, 3, 4, and 4 eggs respectively, of which the largest measured 27 x 10 mm. On

December 16, at Bumbuli, two ♀ ♀ held 4 and 5 eggs respectively, the latter measuring 37 x 12 mm.

Diet. Caecilians (*Boulengerula boulengeri*) of which 7 were recovered from the stomachs of 6 snakes, for details see Barbour and Loveridge (1928).

Parasites. Nematodes (*Kalicephalus* sp.) and their cysts taken from Amani snakes, cestodes (*Proteocephalus* or *Ophiotaenia elapsoides*, and *O. sp.* near *mönnigi*) taken from Amani and Nyange reptiles, mites beneath ventrals of Amani specimen.

Temperament. If gently handled this montane snake makes no attempt to bite so cannot be considered a vicious species. Apparently wholly black examples, their small heads scarcely larger than their bodies, are sufficiently like burrowing vipers (*Atractaspis rostrata*) to be mistaken, others which at first sight appear entirely black, will, if molested, inflate their lungs and thus bring into prominence the series of transverse bars, causing them to look like *Crotaphopeltis h. hotamboeia*. Two Magrotto snakes had lost the ends of their tails, perhaps through fighting; one had a very truncated stump.

Habitat. Vicinity of montane rain forest between 2000 and 3000 feet, in heaps of debris within or without the forest. In the Usambara forests several were encountered on paths between noon and 3 p.m., but at Magrotto I captured four wandering on paths about sunset, their empty stomachs suggesting the reason for their being abroad.

Localities. **Tanganyika Territory:** Magrotto Mountain; Tanga; Uluguru Mountains — Nyange; Usambara Mountains — Amani; Bulwa (Bulua); Bumbuli; near Magila; Nguelo.

Because Sir John Kirk, H. M. Consul at Zanzibar, sent home the type from Ushambola, Boulenger concluded that Ushambola was in Zanzibar. Finding the species abundant in the Usambara Mountains in 1926, I surmised that Ushambola was an archaic spelling of Usambara for Sir John's duties took him up the Pangani River in what was once called the Usambara district. Moreover Aders (1920) remarks that he had never come across the species on the island, but for further confirmation I approached the Survey Department in Zanzibar who replied that they had no knowledge of such a locality as "Ushambola" on the island. **Zanzibar**, therefore, must be excluded from the range.

The three records of the occurrence of *nigra* in Mozambique, Nyasaland, and Northern Rhodesia, are referable to the race *s. deoesteri* whose adults are just as black as *nigra* but have a much lower ventral count.

Range. Eastern Tanganyika Territory (Usambara, Magrotto, and Uluguru Mountains).

ELAPSOIDEA SUNDEVALLII SUNDEVALLII (Smith)

1848. *Elaps sunderwallii* (sic) A. Smith, Ill. Zool. S. Africa, Rept., p. lxvi:
"South Africa to east of Cape Colony."
1880c. Peters, p. 797, pl. —, fig. 2 (*sundevallii*, emend).
1887h. Boulenger, p. 180.
1896d. *Elapechis sundevallii* Boulenger, p. 360.
1897d. Boulenger, p. 375.
1898. Sclater, p. 101.
1898. Werner, 1896–7, p. 147 (see Remarks below).
1908b. Boulenger, p. 230.
1908. Gough (part), p. 34 (omit Orange River Colony).
1910b. Boulenger, p. 519.
1912. FitzSimons, F. W., pp. 166, 168 (omit Griqualand and Basutoland).
1923a. Werner, p. 179 (but restrict range to Natal).
1937e. *Elapsoidea sundevallii* Hewitt, p. 78.
1937a. FitzSimons, V., p. 263.

Another citation of '*sundevalli*' will be found under *s. decosteri*. From Werner onwards several authors have dropped the final 'i' from *sundevallii*; it has not been thought necessary to indicate such trifling deviations.

Description. Snout obtusely pointed; portion of rostral visible from above two-thirds of, equal to, or greater than, its distance from the frontal; internasals half to two-thirds the length of the prefrontals; frontal once and a third to once and a half as long as broad, slightly shorter than, as long as, or longer than, its distance from the end of the snout, slightly shorter than, or two-thirds the length of the parietals; posterior nasal rarely separated from the single preocular; temporals only rarely 1 + 1; anterior sublinguals subequal to, or slightly longer than, the posterior.

For characters common to all forms, see p. 213; for scale counts see statistical table on p. 216.

Color. Young. Above, the apex of a Δ -shaped prolongation of the black nuchal crossbar extends over parietal suture forwards to prefrontals; body barred alternately with black and white, the bars being of equal width, edges of the pale bars lighter and doubtless persisting to form the narrow crossbars of the adult. Below, yellowish.

Adult. Above, slaty gray with a reddish or purplish brown tinge, or

rusty brown, at least part of labials and lower temporal region yellowish, body and tail with $14 + 3^1$ to $34 + 4$ white- or yellow-edged black crossbars, which are as broad as, or much broader than, the interspaces between them, though often narrowing on the sides. Below, usually including lower lateral scale-row, yellowish or whitish, with or without dusky mottling or brownish marbling.

Size. Total length of an unsexed snake (Brit. Mus.), 880 ($825 + 55$) mm., and of a ♀ (Werner, 1898), 625 ($590 + 35$) mm.

Remarks. Smith (1848) gives a detailed account of the type which is worth consulting, its accuracy is vouched for by Peters (1880c) who borrowed the type and a juvenile example from the Royal Swedish Museum before transferring the species to *Elapsoidea* of Bocage, which genus he considers to be closely related to *Hemibungarus* Peters (i.e. *Calliophis* Günther) of southeast Asia.

Peracca's (1896) identifications of "*sundevali*" and "*guentheri*" as occurring at Kazungula on the south bank of the Zambesi, Southern Rhodesia, are both referred to *s. decosteri* though there is a remote possibility that one might be the young of *fitzsimonsi*.

Werner's (1898) record of the 'Cape' must be considered erroneous pending confirmation. His paper deals with three collections, whose source he indicates by putting a 'K' (Kap), 'N' (Natal), or 'T' (Transvaal) after the species. I suggest that the 'K' which appears after his undoubtedly typical *sundevallii*, may well have come from a carelessly written manuscript 'N'.

Gough (1908) mentions several abnormalities, but his "O.R.C" (i.e. Orange River Colony, now Orange Free State) record really refers to a *decosteri*, as does a Pretoria specimen (M.C.Z. 14194) labeled "*sundevallii*" when received from the Transvaal Museum in 1920.

Localities. See three preceding paragraphs. **Natal:** De Deur near Evanton; Durban; Estcourt; Newcastle.

Range. Natal.

ELAPSOIDEA SUNDEVALLII FITZSIMONSI subsp. nov.

- 1910b. *Elaeochis Decosteri* Sternfeld (not Boulenger), p. 31.
- 1910c. Sternfeld, p. 57.
- 1913. *Elaeochis sundevallii* Hewitt & Power (not Smith), p. 165.
- 1935b. FitzSimons, V., p. 326.
- 1937b. *Elapsoidea sundevallii* Mertens (not Smith), p. 15.

¹ The lower number apparently results from loss of the white edging and consequent fusion of two dark crossbars, which results in the dark bars being much narrower than the interspaces.

Type. Chicago Natural History Museum, No. 17667, an adult ♂ from Gomodimo Pan, Kalahari Desert, Bechuanaland Protectorate, collected by Herbert Lang, April, 1930.

Paratypes. C.N.H.M. No. 17668, a ♂ with same data as type; C.N.H.M. 17666, a ♀ taken between Gomodimo and Kuke; also Transvaal Museum (not seen, but data supplied by V. FitzSimons) from Okwa River and Damara Pan respectively, all collected by the Vernay-Lang Kalahari Expedition in April, 1930.

Diagnosis. Differs from typical *sundevallii*, with which it agrees in other respects, in being uniformly purplish brown when adult.

Description. Nasal and preocular in contact; preocular 1; postocular 2; temporals 1 + 2; upper labials 7, the third and fourth entering the orbit; lower labials 6-7 of which the first 3 (3-4 in paratypes) are in contact with an anterior sublingual; ventrals 181 (162-177, not 164-178); subcaudals 21 (17-23).

Snout obtusely pointed; portion of rostral visible from above two-thirds of, or equal to, its distance from the frontal; internasals half to two-thirds the length of the prefrontals; frontal once and a third to once and a half as long as broad, slightly shorter than, as long as, or longer than, its distance from the end of the snout, slightly shorter than, or three-quarters, the length of the parietals; anterior sublinguals subequal to the posterior. (This paragraph is based only on the three specimens examined.)

Color. Young. Above, the apex of a Λ -shaped prolongation of the black nuchal crossbar extends over parietal suture forwards to prefrontals; a dark spot behind eye; sides of head yellowish; body barred alternately with dark slaty brown or black, and pale yellowish or white, the bars being of equal width, edges of the pale scales usually dark-edged. Below, yellowish.

"Adult and halfgrown. Above, uniform dark slaty gray, with a reddish or purplish brown tinge, paler posteriorly and on sides; upper lip, outer row of scales and lower half of adjacent row, creamy white. Below, uniform creamy white, snout and sides of tail tinged with pinkish."

Size. Total length of type ♂ (C.N.H.M. 17667), 714 (671 + 43) mm., surpassed by a ♂ (T.M. 887), 766 (716 + 50) mm.; paratype ♀ (C.N.H.M. 17666), 606 (570 + 36) mm.

Remarks. Named for Mr. Vivian FitzSimons of the Transvaal Museum, who supplied me with numerous scale-counts, and who was the first to invite attention to this form, and whose admirable account of the coloration I have given above.

FitzSimons (1935b) suggests, and probably correctly, that Sternfeld's (1910b) record of *decosteri* from South West Africa is the same as these Bechuanaland specimens. If correct, then Sternfeld's figure of 157 ventrals requires checking as it is slightly lower than the accepted range (162-181).

Whether Peracca's (1896) record of *sunderallii* from Kazungula on south bank of Zambesi, Southern Rhodesia, is referable to this form or to *s. güntherii* where I have put it, is open to question.

Habits. These active snakes were usually found in the vicinity of pans, where their coloration rendered them conspicuous on the light colored sand, in early evening following rain (FitzSimons).

Localities. See remarks above. **Bechuanaland:** Damara Pan; Gomodimo Pan; Gomodimo to Kuke; Okwa River. **Cape Province:** Kimberly; Kimberly Mine. **South West Africa:** Gobabis (as *decosteri*); Okahandja (Transv. Mus.); Okanjande near Otjiwarongo (Mertens).

Range. Eastern Cape Province (Kimberly) west through Bechuanaland Protectorate to South West Africa.

Genus PARANAJA gen. nov.

Genotype. *Naja multifasciata anomala* Sternfeld (M.C.Z. 22380).

Maxillary bone extending forwards as far as the palatine, with a pair of large grooved poison-fangs followed by 2 small teeth; anterior mandibular teeth longest. Head moderate, slightly distinct from neck; eye moderate, with round pupil; nostril between two nasals and an internasal; loreal absent; a single preocular. Body cylindrical; scales oblique, smooth, without pits, in 15-17 rows; ventrals rounded. Tail short; subcaudals in two rows.

Range. Africa from the Belgian Congo to French Cameroon.

Remarks. Though agreeing with *Elapsoidea* in the degree of forward extension of the maxillary bone, the new genus is readily distinguishable from it by external characters such as the larger eye, oblique nature of scalation, and relatively longer tail which in *Elapsoidea* is very short.

The interesting species on which this monotypic genus is based, was first referred to *Naia* (= *Naja*) by its discoverer (1902a) but later was transferred to *Elapechis* (= *Elapsoidea*) with a query by Boulenger (1915a) who had already described it (1904d) as an *Elapechis*. Sternfeld (1917), with only a head, described under the appropriate name *anomala* as a full species what appears to be a recognizable race.

Bogert, who has recently been studying cobra skulls (1943), and to whom I am indebted for the following notes based on his dentitional examination, considers *Paranaja* most closely related to *Pseudohaje* for the palatine in both genera is almost identical in shape, exhibiting a long internal process above the point where it is connected to the prevomer (vomer of most authors), moreover the external process (processus maxillaris) is elongated as in *Pseudohaje* in contrast to the condition obtaining in *Naja* and *Elapsoidea*; in the latter the internal process is greatly reduced, while in *Naja* it is more or less truncate, the curved extension at the posterior end of the process being absent in most species and only feebly developed in *Naja haje*. In view of the similarity of the palatine, as well as agreement with *Pseudohaje* in general shape of the ectopterygoid, pterygoid, and maxillae, it appears probable that other skull characters (no skull being available for examination at the present time) will be found to conform with those of *Pseudohaje*.

Though the distal aperture of the fang in *anomala* is small, as in *Pseudohaje*, Bogert finds the fang length—1.6 mm. (measured by Klauber's method) is contained 250 times in total length, and is, therefore, proportionately about half as large again as in *Pseudohaje* and but slightly larger than in most *Naja*. The further dentition of *anomala*, as shown by M.C.Z. 22380, is: palatine 9-9, pterygoid 19-19, dentary 17-17. Though the palatine count is higher than encountered by Bogert in any African species of *Naja*, it is sometimes exceeded in the Asiatic *N. naja naja*.

The scalation is so irregular that any count is apt to be a trifle confused, for on the specimen in question Bogert found a row dropping out and then reappearing again, the formula being something like 19-17-15-16-15-13, and adds that in all *Pseudohaje* examined by him the preanal count was constantly 11.

The diameter of the eye in *Pseudohaje* is about half its distance from the mouth, whereas in *Paranaja* it is about equal to the distance; such comparisons, however, are likely to be affected by the age of the snake. The ratio of tail into total length is .16, or nearly twice that of *Elapsoidea*, though our specimen is a female.

Thus in the number of teeth on the respective bones, in the number of scales and their imbrication, in size of eye, and in relative tail length, *Paranaja* agrees more nearly with *Naja* than with *Pseudohaje*.

If I were asked to speculate on lines of descent, I would suggest that *Naja*, entering Africa from the northeast, gave rise to both the allegedly arboreal *Pseudohaje* and the presumably terrestrial *Paranaja*, the latter

retaining many *Naja* characteristics. Both are sylvicoline as is *Naja melanoleuca* which likes to bask in trees or is ready to take to them; on the other hand only once have I found the savanna-haunting *N. n. nigricollis* off the ground, and then only in a Bougainvillea.

Key to the Races

- Upper labials 7, sixth largest; range: Belgian Congo, i.e. south of the River Congo *m. multifasciata*
(p. 233)
- Upper labials 6, fifth largest; range: French Cameroons, i.e. north of the River Congo *m. anomala*
(p. 234)

PARANAJA MULTIFASCIATA MULTIFASCIATA (Werner)

- 1902a. *Naia multifasciata* Werner, Verh. Zool.-Bot. Ges. Wien, **52**, p. 347: Upper Maringa River, Belgian Congo.
- 1923a. Werner, p. 183.
- 1904d. *Elapechis Duttoni* Boulenger, Ann. Mag. Nat. Hist. (7), **14**, p. 15: Leopoldville, Belgian Congo.
- 1915a. Boulenger, p. 218.
- 1920a. Witte, p. 62.
- 1920b. Witte, p. 275.
- 1923a. Werner, p. 180.
- 1933a. Witte, p. 70.
- 1915a. *Elapechis ? multifasciatus* Boulenger, p. 219.
- 1920a. Witte, p. 62.
- 1920b. Witte, p. 275.
- 1933a. Witte, p. 70, figs. 1-3.

Description. Snout broadly rounded; rostral broader than deep, the portion visible from above measuring from a third to two-thirds its distance from the frontal; internasals three-quarters the length of the prefrontals; frontal once and a half as long as broad, slightly shorter than, as long as, or longer than, its distance from the end of the snout, two-thirds or four-fifths the length of the parietals; posterior nasal in contact with the single preocular; eye as long as, or longer than, its distance from the nostril; postoculars 2-3; temporals rarely 1 + 2, usually 1 + 3, rarely 2 + 3; upper labials 7, the third and fourth entering the orbit, sixth largest; 4 lower labials in contact with the anterior sublinguals, which are separated from the mental, and slightly shorter than, or as long as, the posterior. Midbody scales in 15-17

rows, 17-19 on neck, 19-21 immediately behind parietals; ventrals 150-174; subcaudals 31-38, all or most in two rows.

Color. Above, snout and sides of head whitish, a dark transverse bar across internasals, a dark streak over labial suture beneath eye, followed by others on labial sutures and temporal region; head (from prefrontals) and body pale brownish, each scale with a dark spot posteriorly resulting in the formation of a series of angular crossbands. Below, whitish.

Size. Total length of *multifasciata* type (Mus. Roy. Hist. Nat. Bruxelles, presumably a ♂ as with 38 subcaudals), 525 (462 + 63) mm., of *duttoni* type (Brit. Mus., presumably a ♀ as with 31 subcaudals, though Boulenger suggested that it might be a ♂), 520 (450 + 70) mm.

Remarks. Werner (1902a) considered that *multifasciata* was most nearly related to "*Naja goldii*" from which it was readily distinguished by its low subcaudal count. Witte (1933a), who reexamined and figured the type, states that the two suboculars described by Werner are nonexistent, and finds 19 instead of 17 scale-rows on the neck, perhaps the explanation may be found in Witte's count having been made nearer the head (*vide Remarks* under genus). Witte also amends the ventral count from 172 to 174, and that of the subcaudals from 36 to 38, strangely enough he has a specimen from Balombo with precisely the same counts — 174 and 38.

Boulenger claimed that *duttoni* was closely related to *E. s. nigra*, an entirely erroneous view; indeed it is somewhat surprising that he ever should have considered placing "*duttoni*" in the genus "*Elaeophis*" from which it differs in the head being slightly distinct from the neck, the moderate eye, the nostril being between two nasals and an *internasal*, midbody scales in 15-17 (instead of 13) rows, with 17-19 on neck, and a tail which is only moderately short.

Localities. **Belgian Congo:** Besankusu; Bolombo (Bolombe); Leopoldville; Upper Maringa River.

Range. Belgian Congo.

PARANAJA MULTIFASCIATA ANOMALA (Sternfeld)

1917. *Naja anomala* Sternfeld, Wiss. Ergeb. Zweit. Deutschen Zent.-Afr.-Exped. 1910-1911, 1, p. 482, pl. xxiv, fig. 9: Assobam Forest region, French Cameroons.
- 1922a. Mertens, p. 182.
- 1923a. Werner, p. 182.
- 1924b. Werner, p. 45.

Description. Differs from the typical form only in those characters mentioned in the key and also, though of no consequence, in the portion of the rostral visible from above measuring from a quarter (type) to two-thirds (M.C.Z. specimen) its distance from the frontal, and the anterior sublinguals being slightly longer than the posterior (type and M.C.Z.). It may be thought by some that these are rather slender grounds on which to recognise a race; in view of a definite geographical barrier, however, the action seems justifiable. As the species is so rare, I append the scale-counts so far published, those of Werner's type as amended by Witte.

P. m. multifasciata

Source	Locality	Midbody scales	Ventrals	Sub- caudals	Upper labials (enter orbit)	Post- oculars
Type	U. Maringa	15	174	38	7 (3rd & 4th)	2
<i>duttoni</i>	Leopoldville	15	150	31	7 (3rd & 4th)	3
Witte	Basankusu	17	164	32	?	?
1933a		17	174	38	?	?

P. m. anomala

Source	Locality	Midbody scales	Ventrals	Sub- caudals	Upper labials (enter orbit)	Post- oculars
Type	Assobam F.	?	?	?	6 (3rd & 4th)	2
M.C.Z.	Bitye, Ja R.	16	164	34	6 (3rd & 4th)	2
Werner	?	15	157	35	6 (3rd & 4th)	?
1924b						

Size. Total length of larger (Werner, 1924b, probably ♀), 515 (440 + 75) mm., of known ♀ (M.C.Z. 22380), 463 (400 + 63) mm.

Remarks. Sternfeld (1917) based his *anomala* on a head only, while noting its similarities to *multifasciata* he was misled by Werner's misstatements regarding the presence of suboculars. He believed that *anomala* has a deeper rostral and larger eye, and went on to compare it with *Naja melanoleuca* of the same size which had an even larger eye. Werner (1924b) records a second example in the Vienna Museum.

Localities. **French Cameroons:** Assobam (Assobom); Bitye, Ja River.

Range. French Cameroons.

BIBLIOGRAPHY

of 319 works mentioning the species dealt with in this paper from 1735-1943. No attempt has been made to complete those prior to 1880, but 1766 contributions to African herpetology published since 1880 have been searched. Titles of papers are omitted for the sake of brevity.

ADERS, W. M.

1920. in Pearce, F. B., "Zanzibar: The Island Metropolis of Eastern Africa." (London), pp. 326-343.

ANDERSSON, L. G.

1901. Bihang Till K. Svenska Vet.-Akad. Handl., **27**, No. 5, pp. 1-26, pls. i-ii.
1916. Göteborgs Kungl. Vetensk. Vitterh. Handl. (4), **17**, No. 5 (= Meddel. Göteb. Musei Zool. Afdel., No. 9), pp. 1-41.

ANGEL, F.

- 1921a. Bull. Mus. Hist. Nat. Paris, **27**, pp. 42-44, figs. 1-3.
1922c. Bull. Mus. Hist. Nat. Paris, **28**, pp. 354-357.
1923b. Bull. Mus. Hist. Nat. Paris, **29**, pp. 348-350, figs. 1-4.
1925a. "Reptiles et Batraciens." in "Voyage de Ch. Alluaud et R. Jeannel en Afrique Orientale (1911-1912). Résultats scientifiques. Vertébrata." (Paris), **2**, pp. 1-63, figs. 1-5, pls. i-iii.
1933f. "Les Serpents de l'Afrique Occidentale Française." (Paris), pp. 1-246, figs. 1-83.

AYLMER, G.

1922. Sierra Leone Studies (Freetown), **5**, pp. 7-37.

BARBOUR T. and LOVERIDGE, A.

- 1928c. Mem. Mus. Comp. Zool., **50**, pp. 87-265, pls. i-iv.
1930a. in Strong, R., "Report of the Harvard-African Expedition upon the African Republic of Liberia and the Belgian Congo." (Cambridge), **2**, pp. 769-786, pls. i-ii.
1930b. *loc. cit. supra*, pp. 786-796.

BIANCONI, J. J.

- 1859? "Specimina Zoologica Mossambicana." (Bologna), pp. 1-282, pls. i-xvii (being reprints of a series of articles from Mem. Accad. Sci. Bologna, 1847-1859).

BLANFORD, W. T.

1870. "Observations on the Geology and Zoology of Abyssinia, . . ." (London), pp. i-xii + 1-487, figs., pls. i-viii + i-iv, map.

BOCAGE, J. V. BARBOZA DU

- 1866a. Jorn. Sci. Lisboa, **1**, pp. 37-56.
1866b. Jorn. Sci. Lisboa, **1**, pp. 57-78, pl. i.
1873b. Jorn. Sci. Lisboa, **4**, pp. 209-227.
1882a. Jorn. Sci. Lisboa, **8**, pp. 286-290.

- 1882b. *Jorn. Sci. Lisboa*, **8**, pp. 299-304.
 1887a. *Jorn. Sci. Lisboa*, **11**, pp. 177-211.
 1895a. "Herpétologie d'Angola et du Congo." (*Lisboa*), pp. i-xx + 1-203, pls. i-xix.
 1895c. *Jorn. Sci. Lisboa* (2), **4**, pp. 1-15.
 1896a. *Jorn. Sci. Lisboa* (2), **4**, pp. 65-104, pls. i-ii.
 1897a. *Jorn. Sci. Lisboa* (2), **4**, pp. 187-206.
 1903a. *Jorn. Sci. Lisboa* (2), **7**, pp. 25-59.
 1903b. *Jorn. Sci. Lisboa* (2), **7**, pp. 65-96.

BOETTGER, O.

- 1887b. *Ber. Senckenberg. Naturf. Ges.*, pp. 135-173, pl. v.
 1887c. *Zool. Anz.*, **10**, pp. 649-651.
 1888a. *Ber. Senckenberg. Naturf. Ges.*, pp. 3-108, pls. i-ii.
 1889. *Ber. Senckenberg. Naturf. Ges.*, pp. 267-316.
 1895. *Zool. Anz.*, **18**, pp. 62-63.
 1898. "Katalog der Reptilien-Sammlung in Museum der Senckenbergischen Naturforschenden Gesellschaft in Frankfurt-am-Main. II. Schlangen." (Frankfurt a. M.), pp. i-ix + 1-160.
 1913. in Voeltzkow, A., 1908-1917, "Reise in Ostafrika." (Stuttgart), **3**, pp. 269-376, pls. xxiii-xxx.

BOGERT, C. M.

1940. *Bull. Am. Mus. Nat. Hist.*, **77**, Art. 1, pp. 1-107, figs. 1-18, pl. i.
 1942b. *Am. Mus. Novit.*, No. 1178, pp. 1-5.
 1943. *Bull. Am. Mus. Nat. Hist.*, **81**, Art. 3, pp. 285-360.

BOULENGER, G. A.

- 1887b. *Proc. Zool. Soc. London*, p. 127.
 1887h. *Zoologist* (3), **11**, pp. 171-182.
 1888d. *Ann. Mag. Nat. Hist.* (6), **2**, pp. 136-141.
 1890b. *Ann. Mag. Nat. Hist.* (6), **6**, pp. 91-93.
 1891a. *Proc. Zool. Soc. London*, pp. 305-309.
 1893a. *Ann. Mag. Nat. Hist.* (6), **12**, p. 273.
 1894a. "Catalogue of Snakes in the British Museum (Natural History)." (*London*), **2**, pp. i-xi + 1-382, figs. 1-25, pls. i-xx.
 1895h. *Ann. Mag. Nat. Hist.* (6), **16**, pp. 171-173.
 1896a. *Ann. Mus. Civ. Stor. Nat. Genova* (2), **16**, pp. 545-554.
 1896c. *Ann. Mus. Civ. Stor. Nat. Genova* (2), **17**, pp. 5-14.
 1896d. "Catalogue of Snakes in the British Museum (Natural History)." (*London*), **3**, pp. i-xiv + 1-727, figs. 1-37, pls. i-xxx.
 1896e. *Proc. Zool. Soc. London*, pp. 920-930, figs. 1-5.
 1897a. *Ann. Mag. Nat. Hist.* (6), **19**, p. 154.
 1897b. *Ann. Mag. Nat. Hist.* (6), **19**, pp. 276-281, figs. -.
 1897d. *Ann. Mag. Nat. Hist.* (6) **20**, pp. 374-376.
 1897e. *Proc. Zool. Soc. London*, pp. 800-803, pl. xlvii.
 1897g. *Ann. Mus. Civ. Stor. Nat. Genova* (2), **17**, pp. 275-280.

- 1898a. *Ann. Mus. Civ. Stor. Nat. Genova* (2), **18**, pp. 715-723, pls. ix-x.
1900b. *Proc. Zool. Soc. London*, pp. 433-456, figs. 1-2, pls. xxvii-xxxii.
1901g. *Ann. Mus. Congo, Zool.* (1), **2**, pp. 1-14, pls. i-v.
1902a. *Proc. Zool. Soc. London*, **1**, p. 126, pl. xli.
1902b. *Proc. Zool. Soc. London*, **2**, pp. 13-18, pls. ii-iv.
1903f. *Ann. Mag. Nat. Hist.* (7), **12**, 350-354.
1904d. *Ann. Mag. Nat. Hist.* (7), **14**, pp. 14-15.
1905c. *Ann. Mag. Nat. Hist.* (7), **16**, pp. 105-115, pl. iv.
1905f. *Mem. Real. Soc. Espan. Hist. Nat.*, **1**, pp. 183-186.
1906i. *Ann. Mus. Civ. Stor. Nat. Genova* (3), **2**, pp. 196-216, figs. 1-9.
1907a. *Mem. Proc. Lit. Phil. Soc. Manchester*, **51**, pp. 1-12.
1907c. *Ann. Mag. Nat. Hist.* (7), **19**, pp. 324-326.
1907j. *Proc. Zool. Soc. London*, pp. 478-487, figs. 140-141, pls. xxi-xxii.
1908a. *Ann. Mag. Nat. Hist.* (8), **2**, pp. 93-94.
1908b. *Ann. Natal Govt. Mus.*, **1**, pp. 219-235, figs. 1-3, pls. xxxv-xxxvi.
1909d. *Ann. Mus. Civ. Stor. Nat. Genova* (3), **4**, pp. 310-311, fig. -.
1910b. *Ann. S. African Mus.*, **5**, pp. 455-538.
1910e. *Ann. Mag. Nat. Hist.* (8), **5**, pp. 512-513.
1911c. *Ann. Mus. Civ. Stor. Nat. Genova* (3), **5**, pp. 161-169.
1912b. *Ann. Mus. Civ. Stor. Nat. Genova* (3), **5**, pp. 329-332.
1915a. *Proc. Zool. Soc. London*, pp. 193-223, figs. 1-2.
1915c. *Proc. Zool. Soc. London*, pp. 611-640, figs. 1-3.
1915d. *Proc. Zool. Soc. London*, pp. 641-658.
1919b. *Proc. Zool. Soc. London*, 1920, pp. 267-298, figs. 1-3.
1919g. *Revue Zool. Afr.*, **7**, pp. 1-29.

BUCHHOLZ, R. and PETERS, W. C. H. see PETERS, W. C. H.

BREIJER, H. G.

1915. *Ann. Transvaal Mus.*, **5**, pp. 111-115.

BÜTTIKOFER, J.

1890. "Reisebilder aus Liberia." (Leiden), **2**, pp. 435-447, and 478, pls. xix-xxxii.

CALABRESI, E.

- 1923b. *Atti. Soc. Ital. Sci. Nat.*, **62**, pp. 145-163, pl. v.
1927. *Atti. Soc. Ital. Sci. Nat.*, **66**, pp. 14-60, pl. i.

CHABANAUD, P.

1917. *Bull. Mus. Hist. Nat. Paris*, 1916, **22**, pp. 362-382, figs. 1-23.
1917b. *Bull. Mus. Hist. Nat. Paris*, **23**, pp. 7-14, figs. 1-3.
1921a. *Bull. Comité Etudes Hist. Sci. Afrique Occ. Franc.*, pp. 44f-472, map, pls. i-iv.
1921b. *Bull. Mus. Hist. Nat. Paris*, **27**, pp. 519-525.

CHUBB, E. C.

1908. *Ann. Mag. Nat. Hist.* (8), **2**, pp. 218-221.
1909a. *Proc. Zool. Soc. London*, pp. 590-597.
1909b. *Rhodesia Mus. Bulawayo 8th Ann. Rep.*, pp. 34-36.

- COPE, E. D.
1860. Proc. Acad. Nat. Sci. Philadelphia, pp. 241-266, 553-566.
- COTT, H. B.
1928. Proc. Zool. Soc. London, pp. 923-961, pls. i-iv.
1935. Proc. Zool. Soc. London, pp. 963-975, pl. i.
- CUNHA, J. G. DE BARROS E.
1935. Mem. Estudos Mus. Zool. Univ. Coimbra (1), No. 83, pp. 1-16.
- DAUDIN, F. M.
1803c. "Histoire naturelle, generale et particulière, des Reptiles." (Paris),
7, pp. 1-436, pls. lxxxi-xcii.
- DESPAX, R.
1911. in Cottes, A., "La Mission Cottes au Sud-Cameroun (1905-1908)."
(Paris), pp. 1-254, pls. i-iii, maps 1-4.
- DUMÉRIL, A. M. C. and BIBRON, G.
1854a. "Erpetologie Générale ou Histoire Naturelle complete des Rep-
tiles." (Paris), 7, pp. i-xii + 781-1536, pls. lxxi-lxxxiv.
- DUMÉRIL, A.
1856c. Revue Mag. Zool. (2), 8, pp. 460-470.
1859. Arch. Mus. Hist. Nat. Paris, 10, pp. 137-240, pls. xiii-xix.
- FERREIRA, J. B.
1900. Jorn. Sci. Lisboa (2), 6, pp. 49-53.
1904. Jorn. Sci. Lisboa (2), 7, pp. 111-117.
1905. Jorn. Sci. Lisboa (2), 7, pp. 159-171, pl. -.
- FISCHER, J. G.
1856b. Abh. Geb. Naturwiss. Hamburg, 3, pp. 79-116, pls. i-iii.
1884a. Jahrb. Hamburg. Wiss. Anst., 1, pp. 33-39, pl. iii.
- FITZINGER, L. J. F. J.
1826. "Neue Classification der Reptilien . . ." (Wien), pp. i-viii + 1-66,
pl. i.
- FITZSIMONS, F. W.
1912. "The Snakes of South Africa; their Venom and the Treatment of
Snake Bite." (Cape Town) 2nd. ed., pp. i-xvi + 1-547, figs. 1-162
+ A-Z, pl. col.
- FITZSIMONS, V.
1935b. Ann. Transvaal Mus., 16, pp. 295-397, figs. 1-30, pls. x-xi.
1937a. Ann. Transvaal Mus., 17, pp. 259-274, pl. x.
1939b. Ann. Transvaal Mus., 20., pp. 17-46.
- GENDRE, E.
1909. Extr. Comptes Rendus Soc. Linn. Bordeaux, in Actes, 63, pp. cv-
cvi.
- GMELIN, J. F.
1788. "Caroli a Linné . . . Systema Naturae . . ." (Lipsiae), ed. 13, 1,
part 3, pp. 1033-1516.

GOUGH, L. H.

1903. Zool. Jahrb. Syst., **17**, pp. 457-468.

1908. Ann. Transvaal Mus., **1**, pp. 17-45.

GÜNTHER, A.

1858c. "Catalogue of the Colubrine Snakes in the Collection of the British Museum." (London), pp. i-xvi + 1-281.

1859a. Ann. Mag. Nat. Hist. (3), **4**, pp. 161-174, pl. iv.

1862b. Ann. Mag. Nat. Hist. (3), **9**, pp. 52-59, 124-132, pls. ix-x.

1863a. Ann. Mag. Nat. Hist. (3), **11**, pp. 20-25, pl. iii.

1864b. Proc. Zool. Soc. London, pp. 303-314, pls. xxvi-xxvii.

1865a. Ann. Mag. Nat. Hist. (3), **15**, pp. 89-98, pls. ii-iii.

1865b. Zool. Rec., **2**, pp. 139-162.

1866a. Ann. Mag. Nat. Hist. (3), **18**, pp. 24-31, pls. vi-vii.

1872a. Ann. Mag. Nat. Hist. (4), **9**, pp. 13-37, pls. iii-vii.

1881b. in Oates, F., "Matabele Land and the Victoria Falls." App., pp. 229-330, pls. C-D.

1888b. Ann. Mag. Nat. Hist. (6), **1**, pp. 322-335, pls. xviii-xix.

1889a. in Oates, F., "Matabele Land and the Victoria Falls." ed. 2, App., pp. 229-330, pls. C-D.

1893. Proc. Zool. Soc. London, 1892, pp. 555-558, pls. xxxiii-xxxv.

1894a. Proc. Zool. Soc. London, 1893, pp. 616-628, pls. liii-lvii.

1895. Ann. Mag. Nat. Hist. (6), **15**, pp. 523-529, pl. xxi.

1895b. "Biologia Centrali-Americana. Reptilia and Batrachia." 1885-1902, (London), pp. i-xx + 1-326, pls. i-lxxvi.

HALLOWELL, E.

1844. Proc. Acad. Nat. Sci. Philadelphia, pp. 58-62.

1852b. Proc. Acad. Nat. Sci. Philadelphia, pp. 203-205.

1854a. Proc. Acad. Nat. Sci. Philadelphia, pp. 98-105.

1857. Proc. Acad. Nat. Sci. Philadelphia, pp. 48-72.

HERMANN, J.

1804. "Observationes zoologicae quibus novae complures aliaeque Animalium species describuntur et illustrantur." (Argentorati & Parisiis), pp. i-viii + 1-332, 1 port.

HESSE, P.

1889. Zool. Garten (Frankfurt am. Main), **30**, pp. 257-267.

HEWITT, J.

1910a. Ann. Transvaal Mus., **2**, pp. 50-71.

1912. Rec. Albany Mus., **2**, pp. 264-285.

1913e. Ann. Natal Mus., **2**, pp. 475-484, pl. xxxix.

1937e. "A Guide to the Vertebrate Fauna of the Eastern Cape Province, South Africa. Part II. Reptiles, Amphibians and Freshwater Fishes." (Grahamstown), pp. 1-118, pls. i-xxviii.

HEWITT, J. and POWER, J. H.

1913. Trans. Roy. Soc. S. Africa, **3**, pp. 147-176.

HOBLEY, C. W.

1912. Journ. E. Africa Uganda Nat. Hist. Soc., No. 5, pp. 43-56, figs.

JAN, G.

1857. Cenni Museo Civico Milano (*non vidi*).
 1858. Revue Mag. Zool. (2), 10, pp. 438-449, 514-527.
 1859. Revue Mag. Zool. (2), 11, pp. 122-130, 148-157, 505-512, pls. iv, v, ix.
 1862. Arch. Zool. Anat. Fisiol., 2, pp. 1-76, pls. v, vii, xvii-xviii.
 1863. "Elenco sistematico degli ofidi descritti e disegnati per l'Iconografia Generale." (Milano), pp. i-viii + 1-143.
 1865-. "Iconographie generale des Ophidiens." (Milano), livre.
 1869. 13-32, pls. (which are numbered afresh for each part).

JEUDE, T. W. VAN LIDTH DE

1895. Notes Leyden Mus., 16, pp. 227-230.
 1898. "Catalogue" Mus. Hist. Nat. Pays-Bas, 10, part 2, pp. 1-54 (fish) + 1-52 (reptiles) + 1-11 (amphibians).

JOHNSTON, H. H.

1898. "British Central Africa." (London), pp. 355-361a.
 1906. "Liberia." (London), 2, pp. 521-1183, illus. maps.

KUHL, H.

1820. "Beiträge zur Zoologie . . ." etc. (Frankfurt am Main), pp. 1-151.

LAMPE, E.

1911. Jahrb. Nassau Ver. Naturk., 64, pp. 137-236.

LAMPE, E. and LINDHOLM, W. A.

1902. Jahrb. Nassau Ver. Naturk., 55, pp. 1-66.

LATREILLE, P. A. see SONNINI etc.

LEPRI, G.

1910. Boll. Soc. Zool. Ital. (2), 11, pp. 317-328.

LINNAEUS, CARL VON

1758. "Systema Naturae." (Holmiae), ed. 10, 1, pp. 1-824.
 1760. "Systema Naturae." (Halaë Magdeburgicae), ed. 12, 1, pp. 1-532

LÖNNBERG, E.

1907. in Sjöstedt, Y., "Wissenschaftliche Ergebnisse der Schwedischen Zoologischen Expedition . . ." etc. (Upsala), No. 4, pp. 1-28, pl. i.
 1911. Svenska Vetensk.-Akad. Handl. (Stockholm), 47, No. 6, pp. 1-42, pls. i-ii.

LÖNNBERG, E. and ANDERSSON, L. G.

1913. Arkiv Zool., 8, No. 20, pp. 1-6.

LÖVERIDGE, A.

- 1916a. Journ. E. Africa Uganda Nat. Hist. Soc., 5, pp. 77-87.
 1916b. Journ. E. Africa Uganda Nat. Hist. Soc., 5, pp. 109-214.
 1918a. Journ. E. Africa Uganda Nat. Hist. Soc., No. 13, pp. 315-338.

- 1923e. Proc. Zool. Soc. London, pp. 871-897.
1924b. Journ. E. Africa Uganda Nat. Hist. Soc., Spec. Suppl. No. 3, pp. 1-16.
1928d. Proc. U. S. Nat. Mus., **73**, Art. 17, pp. 1-69, pls. i-iv.
1928e. Bull. Antivenin Inst. America, **1**, pp. 106-117.
1928g. Bull. Antivenin Inst. America, **2**, pp. 32-41.
1928j. Bull. Antivenin Inst. America, **2**, pp. 72-76.
1929h. Bull. U. S. Nat. Mus., No. 151, pp. 1-135, pl. i.
1933h. Bull. Mus. Comp. Zoöl., **74**, pp. 197-416, pls. i-iii.
1935c. Bull. Mus. Comp. Zoöl., **79**, pp. 1-19.
1936f. Proc. Biol. Soc. Washington, **49**, pp. 59-62.
1936h. Zool. Ser. Field Mus. Nat. Hist., **22**, pp. 1-111.
1936j. Bull. Mus. Comp. Zoöl., **79**, pp. 209-337, pls. i-ix.
1937c. Proc. Acad. Nat. Sci. Philadelphia, **89**, pp. 265-296.
1937f. Bull. Mus. Comp. Zoöl., **79**, pp. 481-541, pls. i-iv.
1938d. Proc. New England Zoöl. Club, **17**, pp. 49-74.
1941e. Proc. U. S. Nat. Mus., **91**, pp. 113-140.
1942e. Bull. Mus. Comp. Zoöl., **91**, pp. 237-373, pls. i-vi.
- MARTINEZ Y SAEZ, DON F. DE P.
1886. Ann. Soc. Esp. Hist. Nat. Madrid, **15**, p. 339.
- MATSCHIE, P.
1891a. Zool. Jahrb. Syst., **5**, pp. 605-611.
1891b. Zool. Jahrb. Syst., **5**, pp. 612-618.
1892. Sitzb. Ges. Naturf. Freunde Berlin, pp. 101-110.
1893c. Mitt. Fors. Gel. Deutschen Schutzgeb., **6**, pp. 207-215.
- MEEK, S. E.
1910. Zool. Series Field Mus. Nat. Hist., **7**, pp. 403-414.
- MERREM, B.
1790. "Beiträge zur Naturgeschichte." (Duisburg & Lemgo), pp. i-ii + 1-47, col. pls. i-xii.
- MERTENS, R.
1922a. Senckenbergiana, **4**, pp. 162-183.
1937b. Abh. Senckenberg. Naturf. Ges., No. 435, pp. 1-23.
1937d. Veröfentlich. Deutschen Kolon.-Übersee-Museum Bremen, **2**, pp. 1-9.
1938b. Abhand. Senckenberg. Naturf. Ges., No. 442, pp. 1-52, pls. i-x.
1938e. Senckenbergiana, **20**, pp. 425-442, figs. 1-6.
1940a. Zool. Anz., **131**, pp. 239-250, fig.
- MOCQUARD, F.
1887b. Bull. Soc. Philom. Paris (7), **11**, pp. 62-92, pls. i-ii.
1889. Bull. Soc. Philom. Paris (8), **1**, pp. 145-148.
1896b. Compte-Rendu Soc. Philom. Paris, pp. 44-45.
1897b. Bull. Soc. Philom. Paris (8), **9**, pp. 5-20.
1897c. Bull. Mus. Hist. Nat. Paris, **3**, pp. 122-123.

- 1899a. Bull. Mus. Hist. Nat. Paris, **5**, pp. 218-219.
 1902b. Bull. Mus. Hist. Nat. Paris, **8**, pp. 404-417.
 1905a. Bull. Mus. Hist. Nat. Paris, **11**, pp. 76-79.
 1905b. Bull. Mus. Hist. Nat. Paris, **11**, pp. 285-290.
 1908a. Bull. Mus. Hist. Nat. Paris, **14**, pp. 259-262.
 1908b. in Foá, E., "Résultats scientifiques des Voyages en Afrique d'Edouard Foá." (Paris), pp. 557-558, map.
- MONARD, A.
 1931. Bull. Soc. Neuchatel. Sci. Nat., **55**, pp. 89-111, figs. 1-5.
 1937b. Arqu. Museu Bocage (Lisboa), **11**, pp. 1-154, figs. 1-3.
- MÜLLER, F.
 1885a. Verh. Naturf. Ges. Basel, **7**, pp. 120-165, pls. ix-xi.
 1885d. Verh. Naturf. Ges. Basel, **7**, pp. 668-717, pls. ix-xi.
 1890b. Verh. Naturf. Ges. Basel, **8**, pp. 685-705, pl. x.
 1892. Verh. Naturf. Ges. Basel, **10**, pp. 195-215, pls. iii-iv.
- MÜLLER, L.
 1910. Abhand. K. Bayer. Akad. Wiss. (München), K1. 2, **24**, pp. 543-626, pl. -.
- NIEDEN, F.
 1911b. Sitzb. Ges. Naturf. Freunde Berlin, pp. 441-452.
- NOBLE, G. K.
 1921b. Nat. Hist. (New York), **21**, pp. 166-171.
- ODHNER, T.
 1908. Arkiv Zool., **4**, No. 18, pp. 1-7.
- PARKER, H. W.
 1933. Ann. Mag. Nat. Hist. (10), **12**, pp. 544-548, figs. 1-2.
 1936c. Novit. Zool. (Tring), **40**, pp. 115-146, figs. 1-2.
 1936e. Ann. Mag. Nat. Hist. (10), **18**, pp. 594-609, figs. 1-13.
 1937a. Ann. Mag. Nat. Hist. (10), **20**, pp. 629-632.
 1940a. Ann. Mag. Nat. Hist. (11), **5**, pp. 257-274, figs. 1-3.
- PARKER, H. W.; MOREAU, R. E. and PAKENHAM, R. H. W.
 1940. Ann. Mag. Nat. Hist. (11), **5**, pp. 309-314.
- PERACCA, M. G.
 1896. Boll. Mus. Zool. Torino, **11**, No. 255, pp. 1-4, figs. -
 1909. in Abruzzi, Duc D', "Il Ruwenzori. Parte Scientifica." (Milano), **1**, pp. 165-180.
 1910. Boll. Mus. Zool. Torino, **25**, No. 624, pp. 1-6.
 1912. Museo Zool. Univ. Ann. Napoli, **3**, No. 25, pp. 1-8.
- PETERS, W. C. H.
 1854. Monatsb. Akad. Wiss. Berlin, pp. 614-628.
 1855. Arch. Naturg., **21**, **1**, pp. 43-58 (reprint of 1854).
 1867b. Monatsb. Akad. Wiss. Berlin, pp. 234-237, pl. -
 1870c. Monatsb. Akad. Wiss. Berlin, pp. 641-652, pls. i-ii.

- 1875a. Monatsb. Akad. Wiss. Berlin, pp. 196–212, pls. i-iii.
 1876a. Monatsb. Akad. Wiss. Berlin, pp. 117–123, pl. i.
 1877c. Monatsb. Akad. Wiss. Berlin, pp. 611–621, pl. –
 1880c. Monatsb. Akad. Wiss. Berlin, pp. 795–798, pl. –
 1881d. Sitzb. Ges. Naturf. Freunde Berlin, pp. 147–150.
 1882a. "Naturwissenschaftliche Reise nach Mossambique . . . Zoologie, 3, Amphibien." (Berlin), pp. i-xv + 1–191, pls. i-xxx.
 1882d. Sitzb. Ges. Naturf. Freunde Berlin, pp. 127–129.

PFEFFER, G.

1893. Jahrb. Hamburg. Wiss. Anst., **10**, pp. 71–105, pls. i-ii.

PITMAN, C. R. S.

1934. "A Check List of Reptilia and Amphibia occurring and believed to occur in Northern Rhodesia." in Pitman, "Report on a Faunal Survey of Northern Rhodesia." (Livingstone), pp. i-xii + 1–500 + Index i-xxxii, maps. A-K.
 1936. Uganda Journal (Kampala), **4**, pp. 41–61, pls. vi-vii + E-G.
 1937. Uganda Journal (Kampala), **4**, pp. 220–246, 319–349, pls. xi-xiii, + H-M.
 1938a. Uganda Journal (Kampala), **5**, pp. 160–244, pls. xv-xviii + R-W.
 1938b. "A Guide to the Snakes of Uganda." (Kampala), pp. i-xxi + 1–382, pls. i-xxviii, col. pls. A-Q, diagrams I-II, maps. (Being a reprint, repaged, of foregoing articles).

POWER, J. H.

- 1927c. Trans. Roy. Soc. S. Africa, **14**, pp. 405–422, fig. 1, pls. xviii-xxii, map.
 1931. Trans. Roy. Soc. S. Africa, **20**, pp. 39–49, figs. 1–2.
 1935. Proc. Zool. Soc. London, pp. 333–346, figs. 1–10, pl. i.

PRATO, A. DEL

1893. "Le Raccolte zoologiche fatte nel Congo dal Cav. Giuseppe Corona." (Parma; privately printed pamphlet), pp. 1–14.

REICHENOW, A.

1874. Arch. Naturg., **40**, **1**, pp. 287–298, pl. ix.

REINHARDT, J. T.

1843. K. Danske Vidensk. Selsk. Afhandl., **10**, pp. 233–277, pls. i-iii.
 1860. Vidensk. Meddel. Naturhist. Foren Kjobenhavn, pp. 209–250, pls. iii-iv.

ROCHEBRUNE, A. T. DE

- 1884a. "Faune de la Sénégalie. Reptiles." (Paris), pp. 1–221, pls. i-xx (Mostly ignored as utterly unreliable).

ROSE, W.

1929. "Veld and Vlei." (Cape Town), pp. i-xxiii + 1–240, figs. –, photos. 1–125.

ROUX, J.

1907a. *Revue Suisse Zool. Genève*, **15**, pp. 75-86.

1907c. *Zool. Jahrb. Syst.*, **25**, pp. 732-742, pl. xxvii.

1936. in Jeannel, R., "Mission Scientifique de l'Omo." **3**, pp. 157-190, figs. 1-4.

SAUVAGE, H. E.

1884b. *Bull. Soc. Zool. France*, **9**, pp. 199-208, pl. vi.

SCHLEGEL, H.

1837. "Essai sur la Physionomie des Serpens." (Leide), **2**, pp. i-xvi + 1-606, and Atlas with pls. i-xxi, maps 1-3.

SCHMIDT, K. P.

1923. *Bull. Am. Mus. Nat. Hist.*, **49**, pp. 1-148, figs. 1-15, pls. i-xxii, maps 1-19.

1933. *Ann. Carnegie Mus.*, **22**, pp. 1-15, figs. 1-2, pls. i-ii.

SCHNEIDER, J. G.

1801. "Historiae Amphibiorum naturalis et literariae." (Jena), **2**, pp. 1-364, pls. i-ii.

SCHOUTEDEN, H.

1933. *Revue Zool. Bot. Afr.*, **23**, pp. 233-238.

SCHWETZ, J.

1934a. *Revue Zool. Bot. Afr.*, **25**, pp. 379-384.

1934b. *Revue Zool. Bot. Afr.*, **26**, Suppl., pp. 23-25.

SCLATER, W. L.

1898. *Ann. S. African Mus.*, **1**, pp. 95-108, pl. v.

SCORTECCI, G.

1928b. *Atti. Soc. Ital. Sci. Nat.*, **67**, pp. 290-339, figs. 1-8, pls. vii-ix.

1931c. *Atti. Soc. Ital. Sci. Nat.*, **70**, pp. 203-215.

1934c. *Rassegna Economica delle Colonie*, **12**, Nos. 1-6, pp. 1-83, figs. 1-36.

1939a. *Ann. Mus. Civ. Stor. Nat. Genova*, **63**, pp. 263-291.

1939c. "Gli Ofidi Velenosi dell'Africa." (Milano), pp. i-xvi + 1-292, figs. 1-151.

1940a. in "Missione Biologica nel paese dei Borana Raccolte zoologiche." (Roma), **2**, pp. 125-150 (=5-30 in separates).

SEBA, A.

1735. "Locupletissimi Rerum Naturalium Thesauri . . ." etc. (Amstel-aedami), **2**, pp. i-xxx + 1-154, pls. i-cxiv.

SJÖSTEDT, Y.

1897. *Kongl. Svenska Vet.-Akad. Handl.*, **23**, Part 4, No. 2, pp. 1-36, pls. i-iii.

SMITH, A.

1838-. "Illustrations of the Zoology of South Africa, Reptiles."

1849. (London), pls. i-lxxviii, App., pp. 1-28.

SONNINI DE MANNONCOURT, C. N. S. and LATREILLE, P. A.

1802. "Histoire naturelle des Reptiles." (Paris), 4, pp. 1-410.

STEINDACHNER, F.

1867a. in "Reise der Oesterreichischen Fregatte Novara . . . Zool." 1, pp. 1-98, pls. i-iii.

STEJNEGER, L.

1893b. Proc. U. S. Nat. Mus., 16, pp. 711-741.

STERNFELD, R.

1908. Sitzb. Ges. Naturf. Freunde Berlin, pp. 92-95.

1908a. Mitt. Zool. Mus. Berlin, 3, pp. 397-432.

1908b. Mitt. Zool. Mus. Berlin, 4, pp. 207-336.

1908c. Mitt. Zool. Mus. Berlin, 4, pp. 237-247.

1909a. "Die Schlangen Togos," in "Die Fauna der deutschen Kolonien," (Berlin), Ser. 2, part 1, pp. i-iv + 1-29, figs. 1-42, map.

1909b. "Die Schlangen Kameruns," in "Die Fauna der deutschen Kolonien," (Berlin), Ser. 1, part 1, pp. i-iv + 1-28, figs. 1-34, map.

1910a. "Die Schlangen Deutsch-Ostafrikas," in "Die Fauna der deutschen Kolonien," (Berlin), Ser. 3, part 2, pp. i-iv + 1-47, figs. 1-54, map.

1910b. "Die Schlangen Deutsch-Südwestafrikas," in "Die Fauna der deutschen Kolonien." (Berlin), 4, part 1, pp. i-iv + 1-45, figs. 1-50, map.

1910c. Mitt. Zool. Mus. Berlin, 5, pp. 51-56.

1911a. Sitzb. Ges. Naturf. Freunde Berlin, pp. 245-251.

1912b. Sitzb. Ges. Naturf. Freunde Berlin, pp. 384-388.

1912c. "Reptilia," in "Wiss. Ergeb. der Deutschen Zentral-Afrika-Expedition 1907-1908." (Leipzig), 1913, 4, pp. 197-279, figs. 1-4, pls. vi-ix.

1917. "Reptilia und Amphibia," in "Wiss. Ergeb. der Zweiter Deutschen Zentral-Afrika-Expedition 1910-1911." (Leipzig, 1917), 1, pp. 407-510, pls. xxii-xxiv.

THEOBALD, W.

1868. "Catalogue of Reptiles in the Museum of the Asiatic Society of Bengal." (Calcutta), pp. 1-88, App., i-iii, four pls.

TORNIER, G.

1896. "Die Kriechthiere Deutsch-Ost-Afrikas . . ." (Berlin, reprinted 1897), pp. i-xiii + 1-164, figs. 1-11, pls. i-v.

1897. Arch. Naturg., 63, 1, pp. 63-66.

1901a. Zool. Jahrb. Syst., 14, pp. 85-86.

1901b. Zool. Anz., 24, pp. 61-66.

UTHMÖLLER, W.

1937. Temminckia (Leiden), 2, pp. 97-134, maps.

1938. Zool. Anz., 124, pp. 41-48.

WAGLER, J. G.

1830. "Naturliches System der Amphibien, . . ." (Monachii), pp. 1-354, pls. i-ix.

WERNER, F.

- 1895b. Verh. Zool.-Bot. Ges. Wien, **45**, pp. 190-194, pl. v.
 1896. Verh. Zool.-Bot. Ges. Wien, **46**, 361-364, pl. vi.
 1897b. Verh. Zool.-Bot. Ges. Wien, **47**, pp. 395-408.
 1898. Jahrb. Abhand. Natur. Magdeburg, 1896-1897, pp. 139-148.
 1898a. Verh. Zool.-Bot. Ges. Wien, **48**, pp. 191-213. figs., -, pl. ii.
 1899a. Verh. Zool.-Bot. Ges. Wien, **49**, pp. 132-157.
 1902a. Verh. Zool.-Bot. Ges. Wien, **52**, pp. 332-348.
 1913a. "Die Lurche und Kriechtiere," in Brehm, A. "Tierleben." (Leipzig), ed. 4, **5**, pp. i-xvi + 1-598, figs., pls., maps.
 1915c. "Reptilia und Amphibia," in Michaelsen, W. "Beitrage zur Kenntniss der Land- und Susswasserfauna Deutsch-Südwestafrikas. III." (Hamburg), pp. 325-376, pl. vii.
 1919. Denks. Akad. Wiss. Wien, **96**, pp. 437-509, pls. i-ii, map.
 1923a. Arch. Naturg., **89**, Abt. A, pp. 138-199, figs. 1-9.
 1924b. Sitz. Akad. Wiss. Wien, **133**, **1**, pp. 29-56, figs. 1-9.
 1925. Arch. Naturg., 1924, **90**, Abt. A, pp. 108-166, figs. 1-17.
 1926. Sitz. Akad. Wiss. Wien, **134**, **1**, pp. 243-257.
 1929a. Zool. Jahrb. Syst., **57**, pp. 1-481, figs. 1-48.

WITTE, G. F. DE

- 1920a. Revue Zool. Afr., **8**, pp. 58-66, figs.
 1920b. Revue Zool. Afr., **8**, pp. 273-282.
 1927d. Revue Zool. Afr., **15**, pp. 320-332.
 1932b. Revue Zool. Bot. Afr., **22**, Suppl., p. 14.
 1933a. Ann. Soc. Sci. Bruxelles (B), **53**, pp. 70-73, figs. 1-3.
 1933j. Revue Zool. Bot. Afr., **24**, Suppl., pp. 111-123, figs.-
 1933m. Ann. Mus. Congo Belge, Zool (1), **3**, pp. 153-188, pls. v-xi.

WYLLIE, E.

1927. S. African Journ. Nat. Hist., **6**, p. 129.

ZENKER, G.

1892. Mitt. Fors. Gel. Deutschen Schutzgeb., **5**, pp. 181-184.